



National Library
of Canada

Acquisitions and
Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale
du Canada

Direction des acquisitions et
des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file - Votre référence

Our file - Notre référence

NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

UNIVERSITY OF ALBERTA

SUPPORT GROUPS FOR INJURED WORKERS WITH MUSCULOSKELETAL
INJURIES: AN EVALUATION

BY

JAVIER MIGNONE



A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF HEALTH SERVICES ADMINISTRATION

DEPARTMENT OF PUBLIC HEALTH SCIENCES

EDMONTON, ALBERTA
FALL 1995



National Library
of Canada

Acquisitions and
Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale
du Canada

Direction des acquisitions et
des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file Votre référence

Our file Notre référence

THE AUTHOR HAS GRANTED AN
IRREVOCABLE NON-EXCLUSIVE
LICENCE ALLOWING THE NATIONAL
LIBRARY OF CANADA TO
REPRODUCE, LOAN, DISTRIBUTE OR
SELL COPIES OF HIS/HER THESIS BY
ANY MEANS AND IN ANY FORM OR
FORMAT, MAKING THIS THESIS
AVAILABLE TO INTERESTED
PERSONS.

L'AUTEUR A ACCORDE UNE LICENCE
IRREVOCABLE ET NON EXCLUSIVE
PERMETTANT A LA BIBLIOTHEQUE
NATIONALE DU CANADA DE
REPRODUIRE, PRETER, DISTRIBUER
OU VENDRE DES COPIES DE SA
THESE DE QUELQUE MANIERE ET
SOUS QUELQUE FORME QUE CE SOIT
POUR METTRE DES EXEMPLAIRES DE
CETTE THESE A LA DISPOSITION DES
PERSONNE INTERESSEES.

THE AUTHOR RETAINS OWNERSHIP
OF THE COPYRIGHT IN HIS/HER
THESIS. NEITHER THE THESIS NOR
SUBSTANTIAL EXTRACTS FROM IT
MAY BE PRINTED OR OTHERWISE
REPRODUCED WITHOUT HIS/HER
PERMISSION.

L'AUTEUR CONSERVE LA PROPRIETE
DU DROIT D'AUTEUR QUI PROTEGE
SA THESE. NI LA THESE NI DES
EXTRAITS SUBSTANTIELS DE CELLE-
CI NE DOIVENT ETRE IMPRIMES OU
AUTREMENT REPRODUITS SANS SON
AUTORISATION.

ISBN 0-612-06433-6

Canada

UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF THE AUTHOR: JAVIER MIGNONE

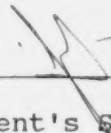
TITLE OF THESIS: SUPPORT GROUPS FOR INJURED WORKERS WITH
MUSCULOSKELETAL INJURIES: AN EVALUATION

DEGREE: MASTER OF HEALTH SERVICES ADMINISTRATION

YEAR OF THIS DEGREE GRANTED: 1995

Permission is hereby granted to the University of Alberta Library to reproduce single copies of this thesis and to lend or sell such copies for private, scholarly or scientific research purposes only.

The author reserves all other publication and other rights in association with the copyright in the thesis, and except as hereinbefore provided neither the thesis nor any substantial portion thereof may be printed or otherwise reproduced in any material form whatever without the author's prior written permission.



(Student's Signature)

207F 5723 112 St
Edmonton, AB
T6H 3J4

(Student's Permanent Address)

July 25, 1995

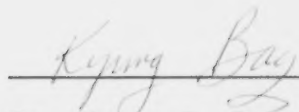
Date

UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES AND RESEARCH

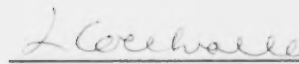
The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled **"SUPPORT GROUPS FOR INJURED WORKERS WITH MUSCULOSKELETAL INJURIES: AN EVALUATION"** submitted by **JAVIER J.C. MIGNONE** in partial fulfillment of the requirements for the degree of Master of Health Services Administration.



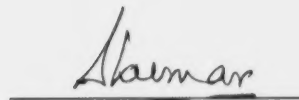
Dr. Tee L. Guidotti (Supervisor)



Dr. Kyung S. Bay



Dr. Linda Cocchiarella



Dr. Shrawan Kumar

Date: July 21, 1995

DEDICATION

To **Mónica**, forever present.

ABSTRACT

This thesis presents the results of an evaluation of a support group program for injured workers with musculoskeletal injuries. The objective of the study was to investigate whether participation in support groups improved the well-being of injured workers in terms of reducing their levels of pain, somatization and depression, and/or increasing their pain-locus-of-control.

Injured workers with musculoskeletal injuries not only suffer physically, but also emotionally and socially. These emotional and social factors favour a tendency towards chronicity. The human and economic costs of chronicity are high for workers, employers, compensation agencies, and the health care system. A low cost intervention such as a support group program that may arrest this tendency, would be highly beneficial.

A support group program was held between October 1992 and March 1994. A total of 62 subjects completed the support group program. The evaluation employed a type of quasi-experimental design, a nonequivalent control group design. A comparison group with 40 subjects was thus created. Due to several limitations, the study only pursued exploratory descriptive analysis.

The major findings of the study were the following:

a) The injured workers that participated in the support groups did not show noticeable improvements in their well-being (pain, depression, somatization and pain-locus-of-control)

immediately after their participation, nor three months afterwards;

b) The injured workers that did not participate in the support groups did not show noticeable change in their well-being (pain, depression, somatization and pain-locus-of-control) eight weeks after the first measurement, nor twelve weeks after the second measurement;

c) Age, length of time since injury and educational level appeared as the most noticeable factors that could have contributed to the improvement or lack of improvement of the injured workers that participated in the study.

The study recommends that support groups for injured workers continue to be organized with an evaluative research component, due to the following:

a) The participation rate in the support groups suggested a need for them among injured workers with length of injuries of more than three months;

b) The themes and contents of the support groups suggested that the groups were an appropriate setting for these workers in which to share and confront their experience;

c) Further research is needed on support groups for injured workers, and larger number of subjects would enable the creation of separate groups with similar strata as a way of controlling for confounding variables (e.g. age, sex, similar type of injuries).

ACKNOWLEDGEMENTS

Without Dr. Tee Guidotti's commitment to the well-being of injured workers and his willingness to explore new approaches, this project would not have taken place. I am thankful for his support and supervision throughout all stages of the project, both during its highs and lows. Many thanks.

My deepest gratitude to all the injured workers that participated in the study, because their teaching is irreplaceable.

My gratitude to the members of the Thesis Committee, Dr. Kyung Bay, Dr. Linda Cocchiarella and Dr. Shrawan Kumar.

A special recognition to Don Voaklander who helped with his expertise at the planning stage of the study.

My acknowledgement to Jill Campbell, Felicity Hey, Kathy Lasell and Mary Tweedie, for all their administrative support.

Without Anna Bubel's assistance in editing and her ongoing support and encouragement during this work, the final product would have been lacking. I am very grateful.

And my dearest thanks to Lucia and Jazmin, because you were always with me.

TABLE OF CONTENTS

DEDICATION

ABSTRACT

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

1. INTRODUCTION

1.1 Statement of the problem.....	1
1.2 Injured workers program and thesis objective....	2
1.3 Study objective and hypotheses.....	4
1.3.1 Objective of the study.....	4
1.3.2 Research Hypotheses.....	4
1.4 Relevance of the study.....	5
1.5 Support group for injured workers project.....	5
1.5.1 Initial pilot project.....	5
1.5.2 Overview of the injured workers program..	6
1.6 Study design.....	10
1.7 Relevance of the thesis in relation to the MHSA Program.....	11
1.8 Ethics.....	12
1.9 Thesis format.....	12

2. LITERATURE REVIEW

2.1 Musculoskeletal injuries.....	14
2.2 Injured workers: physical, social and emotional aspects.....	15
2.3 Social Support.....	19
2.4 Support Groups.....	24
2.5 Instruments.....	26
2.5.1 Pain.....	27
2.5.2 Somatization.....	28
2.5.3 Pain-Locus-of-Control.....	29
2.5.4 Depression.....	30
2.5.5 Baseline demographics.....	30

3. METHODOLOGY

3.1 Subjects.....	32
3.2 Intervention and Comparison groups.....	33
3.3 Subject recruitment.....	33
3.4 Study population.....	35
3.5 Data collection.....	39
3.6 Limitations.....	41

4. RESULTS AND DISCUSSION	
4.1 Description and comparison of Intervention and Comparison Group Subjects.....	45
4.1.1 Description of Intervention Group subjects on independent variables and baseline dependent variables.....	45
4.1.2 Description of Comparison Group subjects on independent variables and baseline dependent variables.....	49
4.1.3 Comparison of the Attrition Group with the Intervention Group on independent variables and baseline dependent variables.....	49
4.1.4 Comparison of the Lost-to-Follow-Up Group with the Comparison Group on independent variables and baseline dependent variables.....	51
4.1.5 Comparison and equivalency tests between Intervention Group and Comparison Group subjects for independent and dependent variables.....	54
4.1.6 Comparison between sub-groups of the Intervention Group.....	56
4.1.7 Comparison between sub-groups of the Comparison Group.....	58
4.1.8 Summary of comparisons.....	58
4.2 Results.....	60
4.2.1 Pre, post, and late-post mean scores of the Intervention Group.....	61
4.2.2 Pre, post, and late-post mean scores of the Comparison Group.....	63
4.2.3 Comparison of results between groups.....	65
4.2.4 Stratified analyses.....	65
4.3 Summary of results.....	73
4.4 Discussion.....	76
5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	
5.1 Summary of the study.....	79
5.2 Major Findings.....	80
5.3 Conclusions.....	81
5.4 Recommendations.....	83
REFERENCES	86
APPENDIX A	93
APPENDIX B	95
APPENDIX C	97
APPENDIX D	99
APPENDIX E	102
APPENDIX F	104
APPENDIX G	107
APPENDIX H	109

LIST OF TABLES

1	Demographic characteristics of Intervention and Comparison Groups	46
2	Baseline dependent variables (measurement #1 mean scores).....	48
3	Demographic characteristics of Intervention and Attrition Groups.....	50
4	Demographic characteristics of Comparison and Lost-to-Follow-Up Groups.....	52
5	Baseline dependent variables (measurement #1 mean scores).....	53
6.1	Intervention Group: age groups by sex	110
6.2	Intervention Group: educational level by working at start of group..	110
6.3	Intervention Group: chronic pain treatment by working status at start of group.....	110
6.4	Intervention Group: time since injury by working status at start of group.....	110
6.5	Intervention Group: time since injury by age groups..	111
6.6	Intervention Group: time since injury by sex.....	111
6.7	Intervention Group: location of injury by sex.....	111
7.1	Intervention Group: baseline dependent variables comparison of sub-groups: sex.....	112
7.2	Intervention Group: baseline dependent variables comparison of sub-groups: marital status.....	112
7.3	Intervention Group: baseline dependent variables comparison of sub-groups: chronic pain treatment....	112
7.4	Intervention Group: baseline dependent variables comparison of sub-groups: age groups.....	113
7.5	Intervention Group: baseline dependent variables comparison of sub-groups: educational level.....	113
7.6	Intervention Group: baseline dependent variables comparison of sub-groups: time since injury.....	113
7.7	Intervention Group: baseline dependent variables comparison of sub-groups: location of injury.....	114
7.8	Intervention Group: baseline dependent variables comparison of sub-groups: working status at start of group.....	114
8.1	Comparison Group: age groups by sex.....	115
8.2	Comparison Group: educational level by working status at start of group.....	115
8.3	Comparison Group: chronic pain treatment by working status at start of group.....	115
8.4	Comparison Group: time since injury by working status at start of group.....	115
8.5	Comparison Group: time since injury by age groups....	116

8.6	Comparison Group: time since injury by sex.....	116
8.7	Comparison Group: location of injury by sex.....	116
9.1	Comparison Group: baseline dependent variables comparison of sub-groups: sex.....	117
9.2	Comparison Group: baseline dependent variables comparison of sub-groups: marital status.....	117
9.3	Comparison Group: baseline dependent variables comparison of sub-groups: chronic pain treatment...	117
9.4	Comparison Group: baseline dependent variables comparison of sub-groups: age groups.....	118
9.5	Comparison Group: baseline dependent variables comparison of sub-groups: educational level.....	118
9.6	Comparison Group: baseline dependent variables comparison of sub-groups: time since injury.....	118
9.7	Comparison Group: baseline dependent variables comparison of sub-groups: location of injury.....	119
9.8	Comparison Group: baseline dependent variables comparison of sub-groups: working status at start of group.....	119
10	Pre, post and late-post mean scores.....	62
11.1	Intervention Group: sex.....	120
11.2	Comparison Group: sex.....	121
12.1	Intervention Group: marital status.....	122
12.2	Comparison Group: marital status.....	123
13.1	Intervention Group: age.....	124
13.2	Comparison Group: age.....	125
14.1	Intervention Group: length of injury.....	126
14.2	Comparison Group: length of injury.....	127
15.1	Intervention Group: educational level.....	128
15.2	Comparison Group: educational level.....	129
16.1	Intervention Group: location of injury.....	130
16.2	Comparison Group: location of injury.....	131
17.1	Intervention Group: chronic pain treatment.....	132
17.2	Comparison Group: chronic pain treatment.....	133
18.1	Intervention Group: working at first measure.....	134
18.2	Comparison Group: working at first measure.....	135

CHAPTER 1

INTRODUCTION

1.1. Statement of the Problem

Musculoskeletal injuries (MSI) are a leading occupational hazard. According to Alberta's Workers' Compensation Board, 73% of injuries in Alberta in 1991 were soft tissue injuries (Robertshaw, 1992).

Aside from the physical consequences of MSIs, the social and emotional effects are serious for the injured workers, favouring a downward spiral towards chronicity. The human and economic costs of chronicity are substantial for workers, employers, compensation agencies, and the health care system. Therefore, a low-cost intervention which may arrest this downward spiral would be highly desirable.

A study of a rehabilitation program for Workers' Compensation recipients in Newfoundland suggested that the beneficial effects of the program may have been due largely to group processes and social factors (Hannah, et al., 1988). The study, however, did not identify which component of the program (physical exercise or support group) likely produced those benefits. The conclusions of the study suggest that "this group or social support effect in the rehabilitation...merits further investigation." (Hannah, et al., 1988).

The basis for justifying the potential of support groups as positively affecting the rehabilitation of injured workers is the conceptual construct of social support (Vugia, 1991). Studies from different perspectives have shown that social support appears to have a positive effect on health. Support groups are a type of social support, which may be considered as hinging between formal and informal social support. The literature contains studies that seem to confirm this positive effect, although evaluative research on support groups is not very extensive. In particular, evaluative research on support groups for injured workers appears to be almost non-existent.

If support groups prove to be of assistance in reducing factors that delay the recovery of injured workers, the WCB or other agencies might consider implementing programs based on mutual support. The cost of organizing and managing these groups is low, compared to the higher costs of having people re-visit physicians, longer claims, etc. If support groups alone are not of assistance, further research should be done to study the interaction between social support (support groups) and physical therapy for injured workers with MSIs.

1.2 Injured workers program and thesis objective

The thesis attempted to evaluate the impact of support groups on injured workers with musculoskeletal injuries. The study was based on work conducted during an 18 month period in

1992-1994. In an injured workers program, nine support groups were organized by the Occupational Health Program, Faculty of Medicine, University of Alberta. Each support group had two hour weekly sessions over an eight week period. The groups were facilitated by a professional mental health worker. The facilitator kept a low profile, and focused on ensuring a safe and trustworthy environment while coordinating the dynamics of the groups. Group members discussed their problems, shared information and engaged in diverse forms of technical, social and emotional exchange.

This thesis investigated whether participation in support groups had a positive impact on workers with musculoskeletal injuries in relation to four health indicators: pain, somatization, depression and pain-locus-of-control. Pain is multidimensional in intensity and emotional response, and plays a key role in the well-being and ability to work of injured workers. Somatization refers to psychiatric entities that consist of elevated and continual bodily distress and symptoms (Fabrega, 1990). Depression, both as effect and cause, is a significant factor in the life of the injured worker. Locus-of-control refers to the link between health attitudes and beliefs to behaviour (Rotter, 1966). Individuals with internal locus-of-control tend to expect reinforcement from their own behaviour, while individuals with external

locus-of-control seek reinforcement from external forces beyond their control.

1.3 Study Objective and Hypotheses

1.3.1 Objective of the Study

The objective of the study was to investigate whether participation in support groups improved the well-being of injured workers with musculoskeletal injuries in terms of reducing their levels of pain, somatization and depression, and/or increasing their pain-locus-of-control.

1.3.2 Research Hypotheses

I) Participants in the support groups are likely to have improved in their levels of pain, depression, somatization and pain-locus-of-control following their participation in the support group.

II) Participants in the support groups are likely to have maintained an improvement in their levels of pain, depression, somatization and pain-locus-of-control 12 weeks after their participation in the support group.

III) Comparison Group subjects are not likely to have improved in their levels of pain, depression, somatization and pain-locus-of-control 8 weeks after the first measurement.

IV) Comparison Group subjects are not likely to have improved in their levels of pain, depression, somatization and pain-locus-of-control 12 weeks after the second measurement.

1.4 Relevance of the study

Given the magnitude of the problem of MSIs among workers, programs with proven capability of assisting in the rehabilitation of these workers are essential both in human and economic terms.

If support groups are of assistance in reducing factors that delay the recovery of injured workers, such groups may be of interest to the WCB or other agencies. The cost of organizing and managing these groups is relatively low compared to conventional costs associated with re-visiting physicians, longer claims, etc. If support groups alone are not of assistance, further research should be done to study the interaction between social support (support groups) and physical therapy for injured workers with musculoskeletal injuries.

1.5 Support Group for Injured Workers Project

1.5.1 Initial Pilot Project

The author of the thesis had participated in the organization and facilitation of support groups with health workers suffering work related health problems in La Plata,

Argentina. Although this experience demonstrated a need for support groups among workers with occupational health problems, no evaluation was done to assess the impact of support groups on the participants' well-being.

Upon the arrival to Canada of the author of the thesis, contact was made with Dr. Tee Guidotti, head of the Occupational Health Program at the University of Alberta. Dr. Guidotti indicated that he believed that a need for support groups for injured workers existed. With funds from Employment Skill Program of Alberta Career Development and Employment, a pilot project was organized. One support group of 7 members for injured workers with musculoskeletal injuries was held in 1991. A qualitative evaluation of the sessions suggested that the participants had found a positive environment in which to share their mutual concerns.

The pilot project showed the feasibility of organizing a subsequent exploratory program. A proposal for a grant from WCB was developed by Tee Guidotti, Don Voaklander and the author of this thesis. The proposal was successful, and funds were received to develop an exploratory program of support groups for injured workers with musculoskeletal injuries.

1.5.2 Overview of the Injured Workers Program

The program consisted of nine support groups held between October 1992 and March 1994. Group members were injured workers with musculoskeletal injuries that met the inclusion criteria (Appendix A). An average of seven members per group completed the sessions. Each support group consisted of eight weekly meetings which spanned over two months. The average duration of each meeting was 1.75 hours, with a minimum of 1.5 and a maximum of two hours. Seven of the groups were held in the afternoon hours; two in the evening. Day groups took place at the Southwest Cultural Centre (Edmonton), and the evening groups at the Central Lions Senior Citizens Recreation Centre (Edmonton). Meetings were held in comfortable informal settings. The only special arrangement was the provision of chairs suitable for individuals with musculoskeletal injuries.

Session formats were similar for all groups. The initial meeting was the most structured, dedicating some time to explaining the purpose and format of the support group and to answer questions raised by the participants. As well, time was allotted for the members to introduce themselves and talk about their personal situation and their expectations regarding the support group.

The same facilitator coordinated all group sessions. His role during the entire process was to ensure a safe group environment in which the participants could freely tell their

story, and express their opinions and feelings. It was a low profile role, with most of the interventions focused on the above mentioned purpose. The facilitator also satisfied requests for information from group members whenever possible, insomuch as this did not interfere with his basic role.

Although group dynamics varied somewhat between groups, certain common patterns emerged. The two initial meetings were mostly devoted to participants telling and retelling their stories. The majority of attritions occurred after the first or second meetings. A more open discussion of concerns occurred from sessions three to seven. The final meeting was mostly dedicated to achieving some kind of group closure and to evaluating the experience. The difference between the groups occurred mostly at the level of dominant themes. The following themes, although common to all groups, varied in emphasis and group time they absorbed.

Story of their injury: Participants repeatedly narrated their job history and the development of their injury. It appeared that there was a need to tell others, and to be believed, that they had worked hard, that their injury was a result of their dedication to their job, and that now that they were limited in their ability to work, few cared about them.

Pain: A basic theme, almost constantly present. How to cope with the pain and means of alleviating it; how it

interfered with sleep; how it didn't allow them to do common household tasks, let alone work at their jobs; how it affected their mood; how it had been disregarded by some health professionals and by the WCB; pros and cons of pills as pain relievers; etc.

Relations with WCB, insurance companies and employers: The experience with WCB and employers was frequently narrated. Predominantly, although not exclusively, feelings of frustration and anger were expressed when detailing these contacts. Group members shared their experience, giving and receiving advice on how to deal better with WCB, insurance companies and employers.

Relations with health professionals: Members described their contacts with physicians, physiotherapists, psychologists, etc. Negative and positive experiences with these health professionals were shared.

Symptom comparison: Participants were surprised to find other individuals with similar types of physical limitations and pain. They shared their experience and exchanged tips on how to better cope with these symptoms in their daily living.

Dependence and independence: The loss of independence after their injury emerged as a significant issue in their lives. The effect of this loss in relation to family members and friends was frequently discussed.

Depression and other emotional issues: Emotional well-being became a more central topic following the first several sessions. Their depressive feelings, their feeling of emotional unstableness, etc., were shared.

1.6 Study design

This study was an evaluation of the support group program and employed a type of quasi-experimental design, a nonequivalent control group design. The approach utilizes self-selected participants. According to Campbell and Stanley (1963), the Comparison Group, "even if widely divergent in method of recruitment and in mean level, assists in the interpretation" of results. These authors indicate that a "before and after, within subjects repeated measures design" is an acceptable design for the evaluation of a program because it permits comparison of baseline scores on the variables of interest with scores obtained after the program. Campbell and Stanley (1963) suggest whenever possible "the addition of even an unmatched or nonequivalent control group" because it "reduces greatly the equivocality of interpretation over what is obtained in the One-Group Pretest-Posttest design."

1.7 Relevance of the thesis in relation to the MHSA program

When considering the relevance of this thesis in relation to the Master of Health Services Administration Program, the primary emphasis is on health services research. The notion of "administration" can be seen from different and similarly valid perspectives. A narrow approach to administration would focus on the technical aspects of administration, i.e. finance, quantitative information, planning, etc. A broader approach recognizes the complexity of the concept of administration, and understands "health outcome" as a variable to study. An article on health services administration curriculum (Seidel, et al. 1992) indicates the difficulty of determining what adds value to a health administration curricula. This article quotes Henry Mintzberg who suggests that "the real issue is the multiple, individualistic, and (sometimes) conflicting perspectives individual faculty contribute to determining 'value'." This thesis is within the realm of health services research because it inquires into an alternative method of dealing with a particular group of health care clients and evaluates its effectiveness in terms of health outcomes. In the end it constitutes an evaluation of a health program, a pertinent field of inquiry within health services administration.

The following is a brief list of the different learning aspects related to a Masters in Health Services Program. They culminate in the production of this thesis.

Proposing, planning, developing and managing a health program;
Implementing an evaluative research of a program;

Working with the program funder, negotiating terms of the program, including funding issues, ethical requirements, access to information, etc.;

Administering program resources;

Learning the internal organization of WCB (the second funder of health care in the province of Alberta) and how it works;

Studying occupational health issues;

Accessing information on a particular group of health care clients from their unique perspective within the system;

Group facilitation;

Field research methodology, design and implementation; and

Data management and analysis.

Because of all the different aspects involved, the entire process had the characteristics of a capstone course in Health Services Administration.

1.8 Ethics

Ethical approval for the study was granted by the Medical Ethics Committee (University of Alberta, Faculty of Medicine).

Subjects' confidentiality was maintained by use of an identifier code for each participant. All data was handled securely and stored consistent with confidentiality requirements.

1.9 Thesis format

The thesis is presented in five chapters. In Chapter 1, the study is introduced, stating the problem, the objective and hypothesis and describing the support group program. A review of the literature in relation to musculoskeletal injuries, physical, social and emotional aspects of injured workers, the concept of social support and its relation to health and well-being, previous research developments on support groups, and the measurement instruments used in the study is presented in Chapter 2. The third Chapter describes the methodology employed, detailing subject recruitment and data collection methods, and explaining methodological limitations. Chapter 4 presents the results. Finally, a summary of the study and the conclusions and recommendations are presented in Chapter 5.

CHAPTER 2

LITERATURE REVIEW

2.1 Musculoskeletal injuries

Although musculoskeletal injuries are a leading hazard among occupational health problems, MSIs involving "soft tissue", the most common form of occupational injury, generally lack precise definitions. The following are brief, and generally accepted definitions of types of MSIs.

- Strain: a strained muscle, ligament, or tendon insertion is one that has been pulled to its extreme by forcing the joint beyond its normal range of motion. (Hoaglund 1990)
- Sprain: a joint injury in which some of the fibres of a supporting ligament are ruptured but the continuity of the ligament remains intact. (Dorland, 1994)
- Tendinitis: inflammation of a tendon;
- Tenosynovitis: inflammation of a tendon sheath;
- Bursitis: inflammation of a bursa;
- Myositis: inflammation of muscle;
- Arthritis: a condition in which a joint is inflamed or abnormal (Hoaglund, 1990).

The most common categorization of body areas in which MSIs occur is the following: injuries of the neck and shoulder; injuries of the elbow, wrist and hand; injuries of

the spine; injuries of the hip; injuries of the knee, ankle and foot (Hoaglund, 1990).

According to Alberta's WCB statistics, claims for injuries to the musculoskeletal system have increased over the last five years (Alleyne & Kanji, 1993). Excluding lower extremities injuries, which the WCB study did not analyze, 39.8% of total accepted claims were for back, neck, upper extremities and shoulder injuries. It is almost certain that if lower extremities had been included in the study, the number of MSIs would surpass the 50% figure of WCB claims.

2.2 Injured workers: physical, social and emotional aspects

There are many physical consequences of musculoskeletal injuries. One of the most common characteristics is the experience of pain, which frequently evolves into a chronic pain condition. It is the perception of pain that mostly limits the capabilities of workers to continue with their occupation in a normal way. This produces a domino effect in their lives, which in many cases has serious consequences. The cycle can be characterized as follows.

A musculoskeletal injury is either caused by a sudden accident or developed over time by repetitive movements and efforts. Consequently, normal work life is made impossible, forcing these workers out of the labour force, either permanently or for long periods of time. In addition to the

pain and/or physical disability suffered by the victims, they also suffer social, financial and emotional problems. If the workers continue working or return to work, the fact that they are not able to carry out tasks without pain and/or without reaching their previous level of production is stressful, as is the fear of re-injury or of losing their job due to the disability. If they are out of work for a long period of time, there is an increased sense of financial insecurity. As well, their self-esteem is affected by losing their previous identity as workers. Household activities, as well as most recreational activities are painful, thus seriously disrupting their previous day to day lives. Restful sleep is disrupted in a majority of cases. Repeated visits to physicians, physiotherapists, etc, begins, usually resulting in a sense of frustration because of slow recovery. In many cases, the injured workers feel that they are not understood or well treated by these professionals. Co-workers, friends and family are perceived as being impatient with their lack of recovery, particularly because their injuries are usually not externally visible and the diagnosis is not always clear. Hence, a growing sense of isolation develops. As suggested by Friedman (1988), visible illnesses or medical conditions evoke social support, whereas invisible disabilities do not. Finally, the relationship with employers and with WCB or other insurance companies is frequently strained. Bigos et al. (1994) indicate

that workers with back injuries "often feel victimized, not helped, by the system." Their financial security is constantly at risk and dependent on the decisions that Compensation will take. A sense of having lost control over their lives predominates, added to the stress caused by their pain and the physical limitations.

The consequences of this cycle are confirmed by several authors. For example, Crook and Tunks (1985) found when comparing chronic pain patients attending a pain clinic with those attending family practice chronic pain groups, that the former presented more somatic and depressive symptoms. Other long term problems included: social withdrawal, job loss, litigation, occupational disability, and drug and alcohol abuse. Sternbach (1974) found that chronic pain patients consistently demonstrated high scores on the depression, hysteria, and hypochondriacal scales of the Minnesota Multiphasic Personality Inventory (MMPI). Pilowsky (1988) suggests that the lowered mood, demoralization, and vegetative symptoms found in pain patients are reactions to a multitude of noxious events they commonly experience. Roy (1992) makes the case that chronic pain patients experience a multitude of losses (loss of health, job, traditional roles, etc.), and that those losses combined with a sense of futility towards recovery dispose them towards nihilism, helplessness, hopelessness and demoralization.

Guidotti (1992) indicates that for the persons with severe and disabling injuries, the presence of a psychological reaction to the condition is a constant in every patient. This author describes how the injury is a defined event that results in alienating the worker from his or her peers, from their employer, and at the extreme, from their family and community. "At the very least, it involves an abrupt reassignment of family and social responsibilities and anxiety over the prognosis and implications of disability, particularly for financial support." (Guidotti, 1992).

Talcott Parsons' (1979) depiction of the role of the sick person in American society provides an interesting clue to the social stress of the injured worker. Parsons indicates that "to be ill is thus to be in a partially and conditionally legitimated state", but that the essential condition for its legitimation "is the recognition by the sick person that to be ill is inherently undesirable, that he therefore has an obligation to try to 'get well' and to cooperate with others to this end." So when the disability of the injured worker persists over time, he or she would appear to be transgressing the condition of legitimation imposed by the society. Hence the alienation of the injured worker from society frequently increases as time goes on, particularly in the case of injuries that lack clear medical evidence. As Parsons (1979) also observes "Where scientific evidence is not available, the

tendency is to give the benefit of the doubt to the possibility that he can help it."

Guidotti (1992) synthesizes the situation as follows: "The injured worker usually assumes a sick role without the preparation of a chronic illness or sustained decline in health. The typical injured worker goes abruptly from independent, self-directed wage-earner and support of person or family to a dependent state...in which they become passive recipients of what is often misunderstood as welfare...Most accept this state for a while, recover, and return to independence. Some do not and either overreact to their new dependent state with anger or become passive and chronically dependent."

2.3 Social Support

The conclusions of a study about the perceived benefits of a lifestyle modification program in the rehabilitation of 41 Worker's Compensation recipients in Newfoundland (Hannah, et al.; 1988) showed positive results. The results, however, did not distinguish which component or components (in particular the physical fitness or the group support components) of the program produced those benefits. The authors of the study suggested that the group or social support effect in the rehabilitation of Worker's Compensation recipients merits further investigation.

According to Hallgren (1988), the concept of social support "emerged as a popular focus of inquiry in the 1970's with the recognition of its potential significance as a mediating factor in the stress-illness relationship and ...[the] acknowledgement of the important role played by the

social environment in human health and well-being." Vugia (1991) indicates that scientific acceptance of "support" as a valid topic for research in the health field came after the concept gained legitimacy through its conceptualization as the construct "social support." In other words, the initial emphasis was on the social structure providing the support, not on the one supported.

Cobb (1976) conceives social support as information belonging to one or more of the following three classes: 1) Information leading the subject to believe that s/he is cared for and loved; 2) Information leading the subject to believe that s/he is esteemed and valued; 3) Information leading the subject to believe that s/he belongs to a network of communication and mutual obligation.

Among the various definitions of social support, some focus on specific aspects of support such as exchanges of information or material aid (Carveth & Gottlieb, 1979), availability of a confidant (Lowenthal & Haven, 1968), and gratification of basic social needs (Kaplan, Cassel & Gore, 1977). A more general definition is provided by Wallston, et al. (1983): "social support describes the comfort, assistance, and/or information one receives through formal or informal contacts with individuals or groups." It is evident that the term social support describes a complex constellation of constructs with some shared elements.

A useful distinction is made by Lin et al. (1981), when they differentiate between instrumental and expressive support. The former includes the provision of material aid and information, whereas the latter includes serving as a confidant and providing acceptance and understanding.

The effect of social support on health and illness has been the object of a variety of studies and reviews in the 70's and early 80's (e.g., Caplan, 1979; Cassell, 1974a, 1974b; Chen & Cobb, 1960; Cobb, 1976, 1979; Dean & Lin, 1977; Gelein, 1980; Haggerty, 1980; Hamburg & Killilea, 1979; Mitchell & Trickett, 1980; Murawski, Penman & Schmitt, 1978). However, some reviewers refer only to psychosocial adjustment or mental illness, others focus on specific populations or on specific crisis situations, and many do not distinguish between physical health and mental or emotional health at all. More recent studies tend to confirm the relationship between physical and mental or emotional health in specific populations. A study (Brown et al., 1989) of 233 rheumatoid arthritis patients indicate that those who reported higher satisfaction with their emotional support when experiencing higher levels of pain were less likely to be depressed than patients who did not perceive such support. Cook & Bickman (1990) indicate that social support and psychological symptomatology (somatization, depression and anxiety) were significantly correlated following a natural disaster in a

sample of 93 subjects from a population that had suffered a major flood. On the other hand, higher social network conflict has been associated with more intense affective pain in subjects with myofascial disorders (Faucett & Levine, 1991). One study pertaining to rehabilitation examines the effects of perceived family support on various indices of physical and emotional factors related to the management of pain in chronic pain patients. This study indicates that perceived support appears to be an important factor in the rehabilitation of these patients (Jamison & Virts, 1990). A 1994 (Schwartzberg) ethnographic study of support groups for persons with head injuries suggests that "Legitimization, the acceptance of the head injury itself as real" was a fundamental factor.

As well, a study of involuntarily unemployed workers who showed significantly elevated levels of depression, anxiety, somatization and self-reported physical illness relative to the stably employed group, indicates that this relationship is affected by social support (Turner, et al. 1991).

Other studies have not confirmed the existence of association between social support and health. These reviews suggest that the validity of the conceptualization and measurement of social support, as well as the theoretical clarification of the relationship between social support and health/well-being, are not yet resolved (Gore, 1984; Thoits, 1982; Wortman, 1984). Further, a study on pain behaviour by

Gil et al. (1987) indicates that subjects reporting high satisfaction with social support exhibited significantly higher levels of total pain behaviour. The study suggests that individuals who are satisfied with the quality of their social support may be satisfied because they receive positive reinforcement from the social environment when they engage in pain behaviour. The authors emphasize, however, that this result does not mean that social support per se is deleterious in chronic pain patients. The negative effects of social support in this population may well be due to a contingent relationship between socially supportive responses and pain behaviours. A more recent study (Fleming, et al. 1992) on a social support group intervention of depressed new mothers suggests that the intervention did not alleviate the depression and may have even been detrimental to their self-confidence.

Wallston et al. (1983) quote a 1982 unpublished study of DeVellis and DeVellis, in which these authors provide a frame of reference to examine social support defined as "learned helplessness." Helplessness (i.e., exposure to unpredictable, uncontrollable, aversive events) has been linked to adverse health outcomes in several studies (Conger, Sawrey & Turrel, 1958; Shultz, 1976). According to Wallston et al., many of the variables that Caplan et al. (1976) found to intervene between social support and adherence to medical regimens are similar

to the variables that describe learned helplessness. These include degree of perceived contingency between an action (non-adherence) and its consequences, level of motivation, perception of one's own competence, and mood states including anxiety and depression.

Wallston et al. (1983) conclude that social support may influence health by disrupting or precluding the state of learned helplessness. In particular, actions that clarify contingencies, add predictability, reduce feelings of non-control or increase feelings of control have been shown to mitigate the undesirable effects of unpredictable, uncontrollable events. These authors suggest that social support could contribute to such actions when supportive others do one of the following: (a) serve as a source of contingent rewards; (b) provide information that helps the individual to anticipate sensations or events and thus to feel a greater sense of predictability; (c) help the individual to interpret events so as to reduce perceptions of personal non-control; and/or (d) force or cajole adaptive responding that produces desirable outcomes and thus heightens the individual's sense of control.

2.4 Support Groups

Support groups hinge between formal and informal types of social support. According to a summary of support mechanisms

suggested by Kaplan et al. (1977), support groups have the potential of providing the following:

- (1) Appraisal opportunities, the chance to evaluate "what's going on", reality reassurances;
- (2) Persuasion, the chance to tell the "other" that his/her dissonant cognitions can be made consistent and rewarding;
- (3) Normative fit, the comfort, the consensus, the complementarity one feels in shared supportive norms;
- (4) Group solidarity, the feeling of "we-ness," oneness, that comes out of social binding encounters;
- (5) Intimacy opportunities, the opportunity to share the most personal thoughts;
- (6) Role-self rewards/approval, the self-esteem that comes from approved feedback for roles well performed.

Gottlieb (1986) describes the support group as a hybrid species, sharing some elements of the self-help mutual aid group, the therapy group, and the psycho-educational group. This author also indicates that the support group literature is in need of more rigorous and systematic evaluative research, ideally adopting experimental and quasi-experimental designs.

Support groups are mentioned in the literature as a resource for chronic pain patients (Gildenberg & DeVaul, 1985; Roy, 1992). Davis et al. (1992), suggest that support group

participation of grieving individuals significantly decreased their perceived stress. The results of a study of a support group for depressed elderly patients on discharge from a hospital indicate a reduced rate of re-referrals and re-admission compared to a control group (Ong, et al., 1987). A 1993 study (Tedeschi & Calhoun) suggests that support groups for the bereaved help to overcome feelings of isolation. A study of five bereavement support groups (Hopmeyer & Werk, 1994) indicates that members of all groups tended to report strong satisfaction. However, as indicated by Gottlieb (1986), rigorous evaluative research on support groups is not extensive. Furthermore, evaluative research focused exclusively on support groups for injured workers appears to be almost non-existent.

2.5 Instruments

Of particular interest for agencies working with injured workers suffering musculoskeletal disabilities are the following health/well being indicators: pain, somatization, depression and pain-locus-of-control. Any reduction in the severity of the first three indicators, and any increase in the latter, potentially can help escape the entrapment of chronic disability.

This subsection reviews the literature on these indicators in relation to their measurement instruments.

2.5.1 Pain

Due to the multidimensional nature of pain (intensity, emotional response, etc.), pain remains one of the most difficult dimensions of health to adequately measure. The McGill Pain Questionnaire or MPQ (Melzack, 1975), however, is the leading pain measurement scale (Bradley et al., 1989). Widely used in pain research, it has been found to provide acceptable validity and reliability (Bradley et al., 1989).

This instrument was designed to quantify three dimensions of the pain experience: sensory, affective, and evaluative. Patients are shown 20 sets of word descriptors and asked to select those word sets that are relevant. The most appropriate word in each word set is to be circled. Each set contains up to six words in ascending order of the dimension described by the set (Appendix B). Ten of the word sets describe the **sensory qualities** of the experience in terms of temporal, spatial, pressure, thermal, and other properties; five of the word sets describe **affective qualities**, in terms of tension, fear, and autonomic properties that are part of the pain experience; a single set describes the **evaluative** dimension, the subjective overall intensity of the total pain experience. The remaining four sets are classified as miscellaneous.

Chapman et al. (1985) indicate two limitations of the MPQ. One is that patients sometimes have difficulty with the

complexity of the vocabulary it uses. The other is that the MPQ weighs sensory aspects of pain more heavily than affective and evaluative. This may be potentially problematic in equally assessing each of the three dimensions of pain.

2.5.2 Somatization

Somatization refers to psychiatric entities that consist of elevated and continual bodily distress and symptoms (Fabrega, 1990). Typically, individuals reporting somatic symptoms are resistant to suggestions that their condition is psychiatric and not medical (Cardoret et al., 1980; Katon et al., 1984).

A promising measurement instrument of somatic perception is the Modified Somatic Perception Questionnaire or MSPQ (Main, 1983). The 13 item questionnaire is specifically designed to measure awareness and reporting of bodily symptoms. It has been developed specifically for use with chronic low back pain patients, although its use with other chronic pain problems has been investigated. It has been shown to have sufficient reliability and validity (Main, 1983). The questionnaire is filled out by the patient (using an 'unstarred' version so that the patient is unaware of which items are being used in the compilation of the score). The 13 starred items are scored from 0 (not at all) to 3

(extremely/could not have been worse) giving a maximum score of 39 (Appendix C).

2.5.3 Pain-Locus-of-Control

The health locus-of-control concept links health attitudes and beliefs to behaviour (Rotter, 1966). Specifically, individuals with internal locus-of-control tend to expect reinforcement from their own behaviour, while individuals with external locus-of-control seek reinforcement from external forces beyond their control (Voaklander, 1992). Although there are few studies linking chronic pain to locus-of-control, research has related health locus-of-control to the management of hypertension (Pender, 1985), acute clinical pain (Chapman and Turner, 1986), and treatment satisfaction in chronic illness (Nagy & Wolfe, 1983).

Pain-locus-of-control can be measured using the Pain-Locus-of-Control Questionnaire or PLC (Main & Waddell, 1991). It is a new Locus of Control Scale devised specifically for use with pain patients (Main, 1988). The PLC consists of 19 items answered on a 4 point Likert scale (Appendix D). Two scales are calculated from subjects' responses. The first (Scale A) is the pain control scale which measures a subject's belief about how well they can control their pain. The second (Scale B), the pain responsibility scale, assesses how much responsibility a subject will accept in the management of

their pain. The PLC has acceptable validity and reliability (Main & Waddell, 1991) and has been shown to be sensitive to changes in patients' attitudes as a result of treatment for chronic pain (Main and Parker, 1989).

2.5.4 Depression

The modified Self-rating Depression Scale or SDS (Zung, 1965) is a convenient depression measurement instrument. The scale consists of 23 items that are rated by subjects via a 4 point Likert scale (Appendix E). The SDS is commonly used to estimate both the presence and severity of depressive symptoms. The SDS has been shown to have acceptable reliability (Zung, 1972; Jagede, 1976) and validity (Biggs et al., 1978; Carroll et al., 1973; Zung, 1969). Researchers have used the SDS both to measure depression and to assess therapeutic intervention effectiveness in the reduction of depression in chronic pain sufferers (Elliot et al., 1986; Magni, et al., 1986; Ahles et al., 1987; Shaw and Ehrlich, 1987; O'Leary et al., 1988; Skinner et al., 1990; Main and Waddell, 1991).

2.5.5 Baseline demographics

Items concerning the subjects age, sex, educational level, marital status, location of injury, length of injury, current chronic pain treatment (if any), and employment status

have been identified as potential moderators of rehabilitation outcome (Frederickson, et al., 1988; Barnes et al., 1989; Beck, 1989; Hester and Decelles, 1989). A baseline demographic questionnaire was specially developed for this study (Appendix F).

CHAPTER 3

METHODOLOGY

3.1 Subjects

The subjects of this study were self-selected workers who suffer from permanent or temporary disability as a result of an occupational injury, and had claims (both settled or pending) with the Workers' Compensation Board (WCB) of Alberta. During a period of 18 months (between October 1992 and March 1994), nine support groups were established by the Occupational Health Program, Faculty of Medicine, University of Alberta, and the injured workers were invited to participate in the support groups from lists provided by WCB.

The criteria for participation were:

- 1) workers who had experienced a musculoskeletal injury (back, upper extremity, or lower extremity injuries) no less than three months and no more than three years before participating in the support groups;
- 2) residence in the greater Edmonton region.

Excluded from participation were workers who suffered from concurrent serious health problems or serious mental disorders (psychosis, institutionalization, requiring major medication, or mental instability with a history of aggression) (Appendix A).

3.2 Intervention and Comparison Groups

Subjects that agreed to join the Intervention Group participated in up to eight support group meetings. Subjects that agreed to participate but attended less than four meetings were not considered, for the purposes of the study, Intervention Group participants. The Comparison Group consisted of WCB clients receiving the standard care they had been referred to in the community, but not participating in a support group. They were invited to participate in the study and were subject to the same inclusion and exclusion criteria used for the support group subjects.

Intervention and Comparison Group subjects answered at least survey #1 and #2. The loss to follow-up in survey #3 of some participants did not exclude them from the study.

Participants that attended less than four sessions of the Support Group were included as Attrition Group subjects. Comparison Group participants who only answered survey #1 were included as Lost-to-Follow-Up Group subjects.

3.3 Subject Recruitment

Intervention Group subjects were derived from both WCB lists and Occupational Medicine Consultation Clinic patient lists. The potential subjects were initially contacted by mail. The mail contained an introductory letter that outlined the purpose of the program, subject requirements, as well as

ethical and confidentiality issues. The letter suggested that they leave a taped message at the voice-mail of the support group project, indicating their interest. Subsequently, they were contacted by phone and the support group coordinator provided further explanations about the project and answers to their questions. They were told that there was no proof that support groups would be of help to them, but that previous support group participants had felt that they had benefited from attending a group. A further screening of subjects according to the inclusion and exclusion criteria was done at the same time. Subjects who were interested in participating received by mail, less than a week before the initiation of the support group, a consent form (Appendix G), the demographic questionnaire and survey #1 (pre-intervention survey) to be filled out.

The invitations to participate in the support groups were sent following the order of the lists, which were organized chronologically according to date of injury. The lists were stratified by sex, age groups and location of injury. The same proportion of invitations was sent for each stratification.

Comparison Group subjects were derived via the same WCB lists used to invite Intervention Group subjects. However, Comparison Group recruitment was initiated after the demographic data of Intervention Group subjects was known. Instead of doing a general mail-out of invitations,

individuals from the list were matched to variables of Intervention Group members (age, gender, anatomical location of injury and length of time since injury).

The mechanism for inviting Comparison Group participants thus differed in that the invitations were sent following the actual stratification of support group participants. This provided a more efficient use of resources while trying to create an equivalent Comparison Group with minimal bias. An important issue that is addressed in the limitations section is the fact that Comparison Group subjects were offered a lottery ticket for each questionnaire answered, as a means of encouraging participation. The incentive was included for the Comparison Group because a pilot effort had brought almost no results.

3.4 Study Population

The WCB and Occupational Medicine Consultation Clinic lists consisted of 2,173 workers with musculoskeletal injuries, grouped by age groups, sex and location of injury (Upper extremity, back, lower extremity).

WCB AND OCCUPATIONAL MEDICAL CONSULTATION CLINIC LISTS

	MALE	FEMALE	TOTAL
UPPER EXTREMITIES	436	101	537
BACK	488	198	686
LOWER EXTREMITIES	714	236	950
TOTAL	1638	535	2173

The lists were sorted by date of injury. Letters inviting to participate in the support group were sent to the initial 1,336 (61%) individuals (within 60% to 68% of each age, sex, and location of injury stratification).

NUMBER OF MAILED AND RECEIVED INVITATIONS FOR INTERVENTION GROUP

	MALE	FEMALE	TOTAL
UPPER EXTREMITIES	263	69	332
BACK	293	131	424
LOWER EXTREMITIES	436	144	580
TOTAL	992	344	1336
LESS RETURNED LETTERS -	-	-	195
TOTAL RECEIVED LETTERS -	-	-	1141

Of the 1336 letters sent, 195 (15%) were returned by Canada Post due to address changes or address errors. Of the 1141 individuals that received the letter, 147 (13%) left a taped message suggesting certain interest in participating. Sixty-four (43.5%) of these individuals did not meet the inclusion criteria or were not fully interested in participating and did not attend the support group. A total of 83 individuals started the support groups. Twenty-one (25%) dropped out of the groups (attrition was defined as having attended less than four sessions). Sixty-two subjects finished the support group, and all of them answered the post intervention

survey. Thus, the Intervention Group population consisted of 62 individuals. Six subjects however were lost to follow-up in the late-post survey, and therefore the population for the last measurement for the Intervention Group was of 56 individuals.

The invitation letters for the Comparison Group (inviting to participate in the study, but not in a support group) were sent out to individuals from the same lists. However, to try to achieve a closer match with the Intervention Group, sampling was stratified to match comparison subjects to the characteristics of the Intervention Group participants (e.g., similar age groups, location of injuries, sex, and length of injury). These invitations were mailed after the last support group had started. Four-hundred and four letters of invitation were mailed. Sixty-five (16%) returned due to change of address or address errors. Of the 339 individuals contacted by mail, 76 (22%) left a taped message suggesting their interest. Twenty-eight (37%) did not meet the inclusion criteria or decided not to participate. Of the 48 subjects remaining, eight (17%) were lost to follow-up because they did not send back survey #1, or only sent back survey #1 but not survey #2. Therefore, a study population of 40 subjects was achieved for the Comparison Group. Seven of these individuals were lost to follow-up for survey #3. The resulting study population for the third measurement was of 33 subjects.

The possible bias arising from this procedure relates to the process of self-selection. Of an extense list of injured workers

invited to participate in a support group, only 7.3% of this list actually started a group, and 5.4% actually completed a group. There is a risk that this group represents a certain type of injured worker. A possible bias is that this population consisted of individuals, "with enough well-being" as to be open to participate in a group. Viceversa, it could be overrepresented with individuals that have suffered more than other injured workers, and are thus willing "to try anything" that may offer some help.

According to Alberta's WCB (Robertshaw, 1992) 90% of workers return to work in 90 days, and the remaining 10% left in the compensation system tend to become chronic. The support groups were focused on this latter group of workers, as specified in inclusion criteria (3 to 36 months since onset of injury). As well the responses to invitations came mostly from subjects not working at the time. Thus the population appears to be of workers in danger of chronicity, which the support groups were directed to.

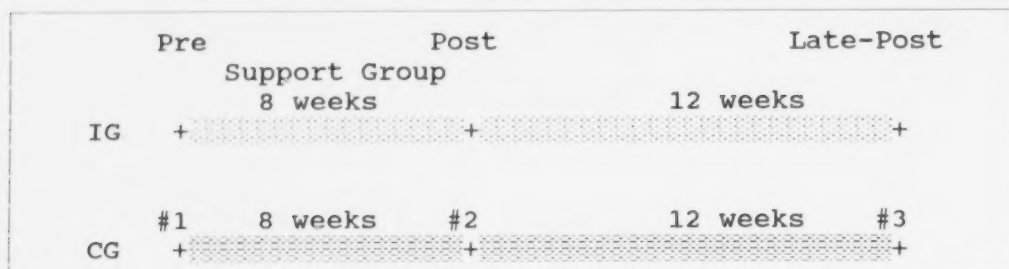
3.5 Data collection

Baseline demographic data were collected from subjects at the time of recruitment, together with survey #1 which consisted of the four questionnaires previously outlined. Subsequent evaluation surveys were administered on a post- (8 weeks after pre-intervention survey), and late post-intervention (12 weeks post intervention) schedule.

Intervention Group subjects were asked to complete the evaluation survey a day or two in advance of the first group session (always less than five days because questionnaires were not mailed out more than a week in advance) or at the beginning of the group session for those that did not answer them before coming or that due to some reason did not receive them by mail. The compliance was ensured by not starting the first session until all subjects had completed the questionnaire. Post-intervention surveys were answered at the end of the last group session. For those that did not attend the last session, their questionnaires were mailed (enclosing self-stamped self-addressed envelopes) within a day, and requested that they be returned within a week. The late post-intervention surveys were mailed to subjects a week before the three months after the last group session. Subjects were asked to complete the late post-surveys within a week and return them in self-addressed stamped envelopes. Non-responders were contacted by telephone 2 weeks after mailing as a follow-up.

Comparison Group subjects received the evaluation surveys through the mail following the same time intervals of the intervention subjects.

Data collection schedule



(IC = Intervention Group)

(CG = Comparison Group)

3.6 Limitations

The design and field realities of the thesis pose several threats to internal validity.

The major issue related to the fact that the design is not truly experimental is that subjects were not randomly assigned to the intervention or the comparison groups. Although subjects were derived from the same lists, they were all invited to pre-determined groups. Thus the control of confounding variables is more difficult, and the presence of selection bias more probable.

Additional threats to internal validity include: selection-maturation, testing and differential statistical regression. As well, if the study did inferential statistics, the small sample size (Intervention Group n=62, Comparison Group n=40) would make it difficult to control in the analysis for confounding factors such as chronic pain treatments outside the support group, age, specific types of injuries and sex.

The potential for differential selection bias is high because the motives for self-selection might have differed between the two groups. The acceptance rate for participation in groups drawn from the general list of invitations differed between the Intervention Group (13%) and the Comparison Group (22%). The low positive response rate to the invitations from the Intervention Group may have indicated that a subgroup of these injured workers felt a need for some sort of support. On the other hand, it is possible that the response reflects an underlying suspicion of the WCB and its motives held by many injured workers, as voiced by workers in the support groups. Alternatively, the higher rate of Comparison Group responses may be attributed to the receipt of lottery tickets in exchange for returned questionnaires. Thus, it is possible that some systematic difference, both in terms of independent and dependent variables, may exist between these two groups.

In relation to external validity, the fact that Intervention Group participants were self-selected is not considered a threat. Support groups by definition are integrated by self-selected individuals. Therefore, the results of the study are generalizable only to injured workers with musculoskeletal injuries **willing to** participate in support groups, not to the entire population of these workers. As well, the percentage of workers that participated in the group was relatively high when considering that most of them would be among the 10% of all injured workers with WCB claims that remain in the system after 90 days (Robertshaw, 1992).

The major reason for using a quasi-experimental design is that a random assignment of subjects to the groups was not feasible. Injured workers who formed the Intervention Group were invited to participate in a program, not a study (although they were informed of the study parameters). The decision to participate in support groups appeared to have been taken out of need. It is highly unlikely that such workers would have agreed to participate in a study which required them to be assigned randomly to either a support or non-support group. Further, a predictably high attrition rate in the non-support group would almost certainly have introduced an undocumented and unknown bias. The internal validity of the study would have been strengthened, but at two essential costs:

- The success of the program (and thus the study) would have been questionable due to insufficient number of willing participants. Injured workers with WCB claims often appear to be resentful of institutions; therefore, subjects willing to participate in a study may feel exploited. This is especially the case for injured workers most in need of a support group.

- The population would not have been of injured workers with a self-recognized need for a support group. It might have only recruited injured workers with enough well-being to participate in a study.

Due to the above mentioned limitations, the thesis does not report and discuss the results of inferential statistical tests. It

limits itself to a descriptive evaluation of the support group program.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Description and comparison of Intervention and Comparison Group subjects

This section describes and compares the Intervention, Comparison, Attrition and Lost-to-Follow-Up groups. Its main purpose is to describe the study population and to assess the equivalency between the Intervention and the Comparison groups. Sub-groups within both the Intervention and the Comparison groups are also compared. Tables of sub-groups comparisons are inserted in Appendix H so as not to disrupt the reading.

4.1.1 Description of Intervention Group subjects on independent variables and baseline dependent variables

Females represented almost 60% of the sample for the Intervention Group (Table 1). A comparison of the male/female ratio of the subjects invited to participate in the support groups (74% Male, 26% Female) with the male/female ratio of the support group subjects (Male 42%, Female 58%) revealed a statistically significant (Chi-Square, Alpha 0.05) female majority of women willing to participate in the support groups.

The distribution of Intervention Group subjects among the age groups of 30-39, 40-49 and 50-59 was almost equivalent.

TABLE 1
DEMOGRAPHIC CHARACTERISTICS OF
INTERVENTION AND COMPARISON GROUPS

	INTERVENTION GROUP n=62 (%)	COMPARISON GROUP n=40 (%)	CHI-SQUARE* p-value
SEX			0.338
Female	36 (58.1)	27 (67.5)	
Male	26 (41.9)	13 (32.5)	
MARITAL STATUS			0.087
Married/Common Law	38 (61.3)	31 (77.5)	
Single/Separ/Div/Widow	24 (38.7)	9 (22.5)	
AGE GROUPS			0.599
20-29	3 (4.8)	3 (7.5)	
30-39	18 (29.0)	9 (22.5)	
40-49	19 (30.6)	12 (30.0)	
50-59	17 (27.4)	15 (37.5)	
60-69	5 (8.1)	1 (2.5)	
TIME SINCE INJURY			0.504
3 to 12 Months	6 (9.7)	7 (17.5)	
13 to 24 Months	38 (61.3)	23 (57.5)	
25 to 36 Months	18 (29.0)	10 (25.0)	
EDUCATIONAL LEVEL			0.223
< Grade 12	17 (27.4)	11 (27.5)	
Grade 12	18 (29.0)	6 (15.0)	
> Grade 12	27 (43.5)	23 (57.5)	
LOCATION OF INJURY			0.645
Upper Extremity	29 (46.8)	16 (40.0)	
Back	22 (35.5)	14 (35.0)	
Lower Extremity	11 (17.7)	10 (25.0)	
CHRONIC PAIN TREATMENT			0.006
Yes	29 (46.8)	8 (20.0)	
No	33 (53.2)	32 (80.0)	
WORKING AT 1ST MEASURE			0.001
Full Time	9 (14.5)	13 (32.5)	
Part Time	5 (8.1)	11 (27.5)	
Not Working	48 (77.4)	16 (40.0)	

* Significant at Alpha 0.05

The majority of subjects were married or living in common law relationships.

In terms of educational levels, a majority of subjects had more than grade 12 education.

The highest frequency in subjects' location of injuries was of upper extremity injuries, followed by back injuries, and finally lower extremity injuries. Half of the Intervention Group was participating in some form of chronic pain treatment, and three quarters were not working at the first measurement.

Table 2 also shows the baseline dependent variable scores of the Intervention Group: pain (33.39), somatization (10.27), pain-locus-of-control scale A (subjects' belief about how well they can control their pain, higher scores indicate better well-being) (7.23), pain-locus-of-control scale B (responsibility a subject will accept for the management of their pain, higher scores indicate better well-being) (6.48), and depression (29.81).

The variability of scores is high. Pain-locus-of-control-A appears to have the highest variability, and depression and pain the lowest.

TABLE 2
BASELINE DEPENDENT VARIABLES (MEASUREMENT #1 MEAN SCORES)

	INTERVENTION GROUP (n=62)		COMPARISON GROUP (n=40)		t-test*
	MEAN	STD DEV	MEAN	STD DEV	p-value
DEPRESSION	29.81	12.74	18.55	11.34	0.000
PAIN	33.39	14.54	20.89	13.68	0.000
SOMATIZATION	10.27	5.78	6.18	5.32	0.000
LOCUS OF CONTROL A	7.23	5.27	8.32	7.15	0.374
LOCUS OF CONTROL B	6.48	3.10	7.70	3.99	0.087

* 2-Tailed, Significant at Alpha 0.05

4.1.2 Description of Comparison Group subjects on independent variables and baseline dependent variables

Almost 70% of the Comparison Group participants were female (Table 1). The Comparison Group was slightly older with more participants in the 40-49/50-59 age groups. The majority of the sample included subjects that were married or living in common law relationships. In terms of educational levels, the majority of subjects had more than grade 12 education. Three quarters (77.4%) of this group did not participate in any chronic pain treatment, and less than half (40%) were not working at first measurement.

Table 2 shows the baseline dependent variable scores of the Comparison Group: pain (20.89), somatization (6.18), pain-locus-of-control A (7.23), pain-locus-of-control B (6.48), and depression (29.81).

The standard deviations indicate a high variability in scores. The highest variability appears in pain-locus-of-control-A and somatization, and the lowest in depression.

4.1.3 Comparison of the Attrition Group with the Intervention Group on independent variables and baseline dependent variables.

Table 3 describes the characteristics of subjects that did not fully participate in the support groups (Attrition Group). The demographic characteristics of the Attrition Group

TABLE 3
DEMOGRAPHIC CHARACTERISTICS OF
INTERVENTION AND ATTRITION GROUPS

	INTERVENTION GROUP n=62 (%)	ATTRITION GROUP n=21 (%)	CHI-SQUARE* p-value
SEX			0.649
Female	36 (58.1)	11 (52.4)	
Male	26 (41.9)	10 (47.6)	
MARITAL STATUS			0.099
Married/Common Law	38 (61.3)	17 (81.0)	
Single/Separ/Div/Widow	24 (38.7)	4 (19.0)	
AGE GROUPS			0.945
20-29	3 (4.8)	1 (4.8)	
30-39	18 (29.0)	8 (38.1)	
40-49	19 (30.6)	6 (28.6)	
50-59	17 (27.4)	5 (23.8)	
60-69	5 (8.1)	1 (4.8)	
TIME SINCE INJURY			0.418
3 to 12 Months	6 (9.7)	4 (19.0)	
13 to 24 Months	38 (61.3)	10 (47.6)	
25 to 36 Months	18 (29.0)	7 (33.3)	
EDUCATIONAL LEVEL			0.169
< Grade 12	17 (27.4)	10 (47.6)	
Grade 12	18 (29.0)	6 (28.6)	
> Grade 12	27 (43.5)	5 (23.8)	
LOCATION OF INJURY			0.595
Upper Extremity	29 (46.8)	12 (57.1)	
Back	22 (35.5)	7 (33.3)	
Lower Extremity	11 (17.7)	2 (9.5)	
CHRONIC PAIN TREATMENT			0.802
Yes	29 (46.8)	10 (50.0)	
No	33 (53.2)	10 (50.0)	
WORKING AT 1ST MEASURE			0.418
Full Time	9 (14.5)	4 (19.0)	
Part Time	5 (8.1)	4 (19.0)	
Not Working	48 (77.4)	13 (61.9)	

* Significant at Alpha 0.05

did not differ substantially from the characteristics of the Intervention Group. The most noticeable difference was that 81% of the Attrition Group was married or living in common law relationships, whereas 61% of the Intervention Group was married. Table 3 shows the cross-tabulations and results of the Chi-Square test for equivalency between the Intervention Group and the Attrition Group on independent variables. Although no statistically significant differences were observed, married subjects appeared more likely to leave the group as were individuals with less than grade 12 education.

Table 4 compares baseline dependent variables between the intervention and the Attrition Group. The Attrition Group shows better levels of well-being in pain, somatization and pain-locus-of-control A, and worse levels of depression and pain-locus-of-control B. The difference in pain and pain-locus-of-control B are statistically significant.

4.1.4 Comparison of the Lost-to-Follow-Up Group with the Comparison Group on independent variables and baseline dependent variables.

A significant difference between the Comparison Group and the Lost-to-Follow-Up Group (Table 5) was that 75% of the Lost-to-Follow-Up group were males, compared to 33% in the Comparison Group.

TABLE 4
BASELINE DEPENDENT VARIABLES (MEASUREMENT #1 MEAN SCORES)

	INTERVENTION GROUP (n=62)	ATTRITION GROUP (n=21)	t-test* p-value
	MEAN	MEAN	
PAIN	33.39	23.35	0.028
SOMATIZATION	10.27	8.54	0.344
LOCUS OF CONTROL A	7.23	6.85	0.814
LOCUS OF CONTROL B	6.48	9.15	0.007
DEPRESSION	29.81	31.15	0.741

* 2-Tailed, Significant at Alpha 0.05

TABLE 5
DEMOGRAPHIC CHARACTERISTICS OF
COMPARISON AND LOST-TO-FOLLOW-UP GROUPS

	COMPARISON LOST-FOLLOW-UP		CHI SQUARE*
	GROUP n=40(%)	GROUP n=8 (%)	p-value
SEX			0.025
Female	27 (67.5)	2 (25.0)	
Male	13 (32.5)	6 (75.0)	
MARITAL STATUS			0.371
Married/Common Law	31 (77.5)	5 (62.5)	
Single/Separ/Div/Widow	9 (22.5)	3 (37.5)	
AGE GROUPS			0.556
20-29	3 (7.5)	0 (00.0)	
30-39	9 (22.5)	4 (50.0)	
40-49	12 (30.0)	2 (25.0)	
50-59	15 (37.5)	2 (25.0)	
60-69	1 (2.5)	0 (00.0)	
TIME SINCE INJURY			0.875
3 to 12 Months	7 (17.5)	2 (25.0)	
13 to 24 Months	23 (57.5)	4 (50.0)	
25 to 36 Months	10 (25.0)	2 (25.0)	
EDUCATIONAL LEVEL			0.315
< Grade 12	11 (27.5)	2 (25.0)	
Grade 12	6 (15.0)	3 (37.5)	
> Grade 12	23 (57.5)	3 (37.5)	
LOCATION OF INJURY			0.332
Upper Extremity	16 (40.0)	1 (12.5)	
Back	14 (35.0)	4 (50.0)	
Lower Extremity	10 (25.0)	3 (37.5)	
CHRONIC PAIN TREATMENT			0.751
Yes	8 (20.0)	2 (25.0)	
No	32 (80.0)	6 (75.0)	
WORKING AT 1ST MEASURE			0.609
Full Time	13 (32.5)	4 (50.0)	
Part Time	11 (27.5)	2 (25.0)	
Not Working	16 (40.0)	2 (25.0)	

* Significant at Alpha 0.05

4.1.5 Comparison and equivalency tests between Intervention Group and Comparison Group subjects for independent and dependent variables

Females formed the majority of participants in both the Intervention Group and the Comparison Group (Table 1).

In relation to age distribution, both groups appeared essentially equivalent. A comparison between the Intervention Group and Comparison Group revealed a similar age distribution between both groups.

The most noticeable difference between the groups was that the percentage of Intervention Group subjects not living in a relationship was almost double the percentage in the Comparison Group (38.7%-IG; 22.5%-CG). It could be inferred that individuals living alone may seek more outside social support than those in a married or common law relationship.

In both groups, a majority of subjects had more than grade 12 education. However, this figure was almost 15% higher in the Comparison Group than in the Intervention Group. The fact that almost 3/4 of the participants in both groups had grade 12 or more education (exactly 72.5% in both cases), could indicate that educational level can be a factor in the willingness to participate in support groups or in studies.

The distribution of injury locations followed a similar pattern for both groups: upper extremity injuries were most

common, followed by back injuries, and lower extremity injuries. The only difference between the groups was that the Intervention Group subjects experienced more upper extremities injuries, while Comparison Group subjects were more equally distributed across the three injury locations.

In the case of two variables, chronic pain treatment and working status, the two groups were less equivalent. Three quarters (80%) of the Comparison Group sample did not participate in any chronic pain treatment, while half (53.3%) of the Intervention Group did. Conversely, although three quarters (77.4%) of the Intervention Group were not working, over 60% of the Comparison Group were employed. The results of Chi-Square test for equivalency (Table 1) indicated statistically significant differences between both groups in these two variables.

These differences limit the comparability between the groups. The indicators could suggest that the physical limitations of the Intervention Group subjects were greater than those of the Comparison Group. As well, this could indicate that the Intervention Group subjects were more representative of the 10% of workers considered "chronics" by WCB (Robertsha, 1992).

Table 2 compares the baseline mean scores for the Intervention Group and the Comparison Group. The comparison shows that the Comparison Group had better scores. The

independent samples t-tests (performed to test the equivalency of baseline dependent variables between both groups) indicated significantly higher levels of pain, somatization and depression among Intervention Group subjects. Pain-locus-of-control A and pain-locus-of-control B did not show significant differences.

The equivalency between groups was challenged in that the overall well-being of the Comparison Group subjects appeared better than the other group. The fact that more subjects in the Intervention Group were under chronic pain treatment, and that fewer were working, was consistent with their higher levels of pain, depression and somatization. These results seem to suggest that the motivations to participate were different between the groups. The invitations to participate in a support group may have attracted injured workers that were suffering more because they offered something that could help them cope with their situation. On the other hand the Comparison Group subjects' interest might have resided more on the opportunity to receive a lottery ticket.

4.1.6 Comparison between sub-groups of the Intervention Group

Tables 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, and 6.7 compare independent variables of Intervention Group sub-groups.

The only crosstabulation that showed a statistically significant difference between subgroups (Chi-square) was

between subjects working at the start of the group and subjects undergoing chronic pain treatment. Most of the subjects working full-time were simultaneously undergoing pain treatment, whereas most of those not working were not undergoing treatment.

Although the pattern was not statistically significant, injuries among females appeared concentrated on upper extremities and back, whereas the distribution of injuries was more equal among males.

The remaining comparisons did not show noticeable unequivalencies between subgroups on independent variables.

Tables 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7 and 7.8 show the results of the equivalency tests for baseline dependent variables between sub-groups of the Intervention Group. Statistically significant differences existed in baseline pain, where subjects aged 30 to 39 showed significantly higher pain levels than the other age groups. As well, pain-locus-of-control A and pain-locus-of-control B scores showed statistical significance when age groups were considered. Older individuals (ages 50 to 69) showed less belief in their ability to control pain and accept less responsibility for the management of their pain than younger subjects. As well, educational level appeared to be a factor affecting pain-locus-of-control A scores, where those with more than grade 12 education appeared to show more belief in their ability to

control their pain. No other statistically significant differences existed.

4.1.7 Comparison between sub-groups of the Comparison Group

Tables 8.1, 8.2, 8.3, 8.4, 8.5, 8.6 and 8.7 compare independent variables of Comparison Group sub-groups. No crosstabulation showed a significant difference (Chi-Square) between sub-groups.

Tables 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7 and 9.8 show the results of the equivalency tests for baseline dependent variables between sub-groups of the Comparison Group. The equivalency was challenged in the pain scores between females and males, with the latter group showing significantly higher levels of pain. As well, subjects undergoing chronic pain treatment showed higher levels of pain. Subjects undergoing chronic pain treatment showed significantly lower scores in pain-locus-of-control B, indicating that they accepted less responsibility for management of their pain. The same was true for unmarried subjects.

4.1.8 Summary of comparisons

The comparison between Intervention and Comparison Group baseline independent and dependent variables showed that the groups were not equivalent. In regards to the demographic characteristics, the groups were similar in sex, age groups,

time since injury and location of injury distributions. However, they were disimilar in marital status, educational level, chronic pain treatment status and working status. These differences achieved statistical significance in the latter two characteristics.

When baseline dependent variables were compared, the disimilarity was more noticeable. The Intervention Group showed higher levels of pain, somatization and depression, as well as less belief in their ability to control pain and accept responsibility for the management of their pain. For the former three variables, these differences achieved statistical significance.

The disimilarities between the Intervention and Comparison Groups in both demographic characteristics and dependent variables appeared somewhat consistent. Significantly higher numbers of Intervention Group subjects undergoing chronic pain treatment and/or experiencing unemployment were consistent with lower levels of well-being as shown in baseline dependent variables.

The comparison between sub-groups of both the Intervention and the Comparison Groups was done to assess the need for stratifying the analyses. Given the results of the equivalency tests between sub-groups, it would be desirable to stratify by age, sex, educational level, and chronic pain treatment status. Age appeared to be a confounding factor in

baseline pain levels and pain-locus-of-control for Intervention Group subjects. For the Comparison Group, pain levels were significantly higher among males, and among subjects undergoing chronic pain treatment. As well, married subjects and those not undergoing pain treatment showed higher acceptance of responsibility for managing their pain.

These differences would suggest the presence of uncontrolled confounding factors. A stratified analysis can be of assistance in trying to control for this confounding. Because descriptive statistics were used, the results can be compared between sub-groups. A much larger sample size would have been required in order to achieve enough power in each cell to execute a stratified analysis for inferential statistics.

4.2 Results

This section includes the main results of the study. It confronts the hypotheses with the overall post and late-post results for both the Intervention and the Comparison groups. As well the results of the stratified analysis by sex, marital status, age, length of injury, educational level, location of injury, chronic pain treatment and working status are presented. The tables for the latter analyses are inserted at the end of the chapter so as not to disrupt the reading.

4.2.1 Pre, post and late-post mean scores of the Intervention Group

Hypotheses

I) Participants in the support groups are likely to have improved in their levels of pain, depression, somatization and pain-locus-of-control following their participation in the support group.

II) Participants in the support groups are likely to have maintained an improvement in their levels of pain, depression, somatization and pain-locus-of-control 12 weeks after their participation in the support group.

Table 10 shows the mean scores for the Intervention Group.

The mean score for depression showed a slight decrease immediately after the intervention and three months later.

A slight decrease in the mean scores for pain occurred after the intervention; an increase to the previous level occurred three months later.

Mean scores for somatization followed a similar pattern. A slight reduction occurred from pre to post intervention measurement, followed by an increase in somatization levels at the third measurement. These last measures were even higher than those calculated at first measurement.

Pain-locus-of-control, scale A, showed a decrease in mean scores from pre to post measurements, the opposite of what was hypothesized (for both scales of the pain-locus-of-control

TABLE 10
PRE, POST AND LATE-POST MEAN SCORES

	INTERVENTION GROUP					
	PRE (N=62)		POST (N=62)		LATE-POST (N=56)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	29.81	12.74	29.23	10.79	28.27	10.43
PAIN	33.29	14.54	32.20	13.80	33.40	13.97
SOMATIZATION	10.27	5.78	10.19	6.90	11.16	7.64
LOCUS CONTROL A	7.23	5.27	6.74	5.59	7.63	5.34
LOCUS CONTROL B	6.48	3.10	6.44	3.55	6.80	2.94

	COMPARISON GROUP					
	PRE (N=40)		POST (N=40)		LATE-POST (N=33)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	18.55	11.34	18.75	11.26	19.70	11.70
PAIN	20.89	13.68	21.17	15.19	20.44	14.55
SOMATIZATION	6.18	5.32	5.82	4.16	7.09	5.30
LOCUS CONTROL A	8.32	7.15	7.35	7.10	6.73	6.63
LOCUS CONTROL B	7.70	3.99	7.10	3.56	6.42	3.21

questionnaire, an increase in scores indicates improvement in well-being). Instead the comparison between post and late-post measurements showed an increase in mean scores.

Summarizing, contrary to what was hypothesized no major improvements appeared to have taken place. Only very minor decrease in depression, pain and somatization mean scores exist between pre and post intervention measurements. Both types of pain-locus-of-control did not show improvement. With the exception of depression, the slight improvement in pain and somatization was not maintained three months post-intervention. Overall, no reportable changes in mean scores occurred.

4.2.2 Pre, post and late-post mean scores of the Comparison Group

Hypotheses

III) Comparison Group subjects are not likely to have improved in their levels of pain, depression, somatization and pain-locus-of-control 8 weeks after the first measurement.

IV) Comparison Group subjects are not likely to have improved in their levels of pain, depression, somatization and pain-locus-of-control 12 weeks after the second measurement.

Table 10 shows the results of the pre, post and late post mean scores of the Comparison Group.

Mean scores for pain slightly increased from the first to the second measurement, and slightly decreased from the second to the third measurement.

Somatization levels showed a slight decrease when comparing the first and second measurements. An increase in mean scores was noted between the second and third measurements.

Mean scores for depression increased slightly between first and second measurements, as well as between second and third measurements.

Scale A of pain-locus-of-control showed a decrease in mean scores when comparing first and second measurements, and second and third measurements.

Scale B of pain-locus-of-control showed a decrease in mean scores from first to second measurements, and second to third measurements.

Summarizing, with the exception of somatization mean scores, Comparison Group subjects showed scores that indicate a very slight worsening in well-being from first to second measurements. The comparison between second and third measurements showed a very slight improvement in mean scores in pain and pain-locus-of-control A and B. The mean scores in depression and somatization indicated an increase from second and third measurements. Again, as with the Intervention Group, no reportable difference in mean scores was noted.

4.2.3 Comparison of results between groups

A slight improvement in the levels of depression and pain experienced by Intervention Group subjects coupled with the slight worsening of Comparison Group subjects at the second measurement, suggests that the intervention could have had a positive effect in the case of these two variables. However this could also be a consequence of differential statistical regression (considering that the baseline mean scores of the Intervention Group were higher on these variables). As well, the differences are too minor to suggest differential changes in the variables under study.

4.2.4 Stratified analyses

The description of the stratified analysis focuses on the difference between first (pre) and second (post) measurements. However, the results of third (late-post) measurements are included in the tables.

Sex (Tables 11.1 and 11.2)

Depression: Intervention Group females' and males' post mean scores decreased and increased in the late-post measurement. Comparison Group subjects showed an increase in depression for both genders at post measurement.

Pain: Females' pain levels decreased for intervention and Comparison Groups, whereas males' scores increased in both groups.

Somatization: Females' levels decreased for intervention and Comparison Groups, whereas male scores increased in both groups.

Pain-Locus-of-Control-A: Neither females nor males in both group showed any improvement.

Pain-Locus-of-Control-B: Only females in the Intervention Group showed an improvement.

A slight improvement in depression was observed for both females and males of the Intervention Group. For the remaining variables except pain-locus-of-control-A, females tended to show more improvement than males in the Intervention Group. Females in the Comparison Group showed improvement in pain and somatization, whereas males did not show improvement in any variable. The effect of gender is not clear, although females seemed to show improvement in more variables.

Marital Status (Tables 12.1 and 12.2)

Depression: Married subjects improved in both the intervention and the Comparison Group, whereas single/divorced individuals did not.

Pain: Married and unmarried individuals showed improvement in the Intervention Group, but showed no improvement in the Comparison Group.

Somatization: An inverse pattern was observed between the Intervention and Comparison Group subjects. Only unmarried

individuals showed improvement after the support group, whereas only married individuals of the Comparison Group showed improvement at the second measure.

Pain-Locus-of-Control-A: Irrespective of the Intervention or the Comparison Groups, married subjects improved and unmarried subjects did not improve.

Pain-Locus-of-Control-B: Only married subjects from the Intervention Group showed some improvement.

The main pattern that appeared is that being married could be a factor in the improvement of depression and in a subjects' belief on how well they can control their pain (pain-locus-of-control scale A).

Age (Table 13.1 and 13.2)

Depression: All age groups of the Intervention Group, with the exception of age bracket 50-59, showed a decrease in mean scores at post and late-post measurements. Instead, the Comparison Group only showed improvement in the two youngest age groups.

Pain: Again with the exception of age group 50-59, all other age groups of the Intervention Group showed lower pain levels at the first measurement. The Comparison Group showed improvement in two age groups, 30-39 and 40-49.

Somatization: For Intervention Group subjects, levels at post measurement decreased in the 20-29 and 40-49 age groups,

increased in the 30-39 and 50-59, and did not change for the 60-69 groups. The pattern for Comparison Group subjects was almost the opposite: decrease for those 30-39 and 50-59, and an increase for the other three age brackets.

Pain-Locus-of-Control-A: The majority of age brackets of the Intervention and the Comparison Group did not show improvement; the exceptions were the 50-59 group for the former, and the 40-49 group for the latter.

Pain-Locus-of-Control-B: The two oldest age groups of the Intervention Group showed improvement, whereas only the youngest age bracket of the Comparison Group improved.

It would seem that younger age groups tended to show improvement in depression and pain levels irrespective of their participation in support groups. The results for the other variables did not suggest any particular trend.

Length of injury (Tables 14.1 and 14.2)

Depression: Intervention Group subjects who had been injured for less than 24 months seemed to have improved, whereas Comparison Group subjects with injuries of less than 12 months showed lower levels of depression.

Pain: As with depression, Intervention Group participants who had been injured for less than 24 months showed improvement. Comparison Group subjects who had been injured between 13 and 24 months had a lower mean score.

Somatization: As with depression and pain, Intervention Group subjects who had been injured for less than 24 months showed decreased scores. In this variable, Comparison Group subjects showed the same pattern.

Pain-Locus-of-Control-A: Both intervention and Comparison Group subjects who had been injured for less than 24 months did not show improvement at the second measurement, whereas in both cases subjects who had been injured between 25 to 36 months had better scores.

Pain-Locus-of-Control-B: Both intervention and Comparison Group subjects who had been injured 24 months or less did not show improvement at the second measurement. However, Intervention Group subjects who had been injured between 25 to 36 months had better scores.

The results suggest that subjects with longer injuries showed less improvement in depression, pain and somatization in both groups, whereas these same subjects tended to show better results in pain-locus-of-control A.

Educational Level (Tables 15.1 and 15.2)

Depression: Intervention Group subjects with grade 12 or less had lower mean scores, whereas only Comparison Group subjects with grade 12 education showed this improvement.

Pain: Both intervention and Comparison Group subjects showed the same pattern. Lower mean scores were shown by subjects both with less and with more than grade 12 education.

Somatization: Intervention Group subjects with grade 12 were the only ones that showed improvement, whereas Comparison Group subjects with grade 12 and more than grade 12 had lower mean scores.

Pain-Locus-of-Control-A: Intervention Group subjects with less than grade 12 showed improvement, whereas Comparison Group subjects with more than grade 12 showed improvement.

Pain-Locus-of-Control-B: Only Intervention Group subjects with less than grade 12 showed improvement.

Intervention Group subjects with less than grade 12 showed improvement in all dependent variables except somatization, suggesting that subjects with lower educational levels may have benefited more from the support group than those with more education.

Location of injury (Tables 16.1 and 16.2)

Depression: Intervention Group subjects with lower extremity and back injuries showed improvement, whereas Comparison Group subjects with upper extremity and back injuries showed improvement.

Pain: Back injury subjects improved in both groups, as did upper extremity subjects from the Intervention Group.

Somatization: Intervention Group subjects with lower extremity and back injuries showed improvement, whereas Comparison Group subjects with upper and lower extremity injuries showed improvement.

Pain-Locus-of-Control-A: Upper extremity subjects from the Intervention Group showed better mean scores, whereas back injury subjects from the Comparison Group showed better mean scores.

Pain-Locus-of-Control-B: Only upper extremity subjects from the Intervention Group showed an improvement.

The location of the injury did not appear to be a factor in the improvement of the subjects.

Chronic Pain Treatment (Tables 17.1 and 17.2)

Depression: Whether under chronic pain treatment or not, Intervention Group subjects showed lower mean scores at post-measurement. Comparison Group subjects not undergoing chronic pain treatment showed improvement.

Pain: Neither intervention nor Comparison Group subjects undergoing chronic pain treatment showed an improvement in pain levels, whereas those not undergoing treatment showed an improvement.

Somatization: Only Intervention Group subjects undergoing chronic pain treatment had lower mean scores.

Pain-Locus-of-Control-A: With or without chronic pain treatment, subjects from the Intervention Group and the Comparison Group showed no improvement.

Pain-Locus-of-Control-B: Intervention Group subjects not undergoing chronic pain treatment showed improvement, whereas Comparison Group subjects undergoing treatment showed improvement.

Chronic pain treatment did not appear to be a confounding factor. Contrary to what could have been expected, subjects from the Intervention Group and the Comparison Group undergoing chronic pain treatment did not show improvement in pain level, whereas those not undergoing pain treatment showed improvement in pain. However what could be confounding is that subjects undergoing pain treatment could also be subjects with less initial well-being, thus showing less improvement at second measurement.

Working status (Tables 18.1 and 18.2)

Depression: Subjects from the intervention and the Comparison Group who worked full-time had better mean scores. This is also true for non-working subjects in the Intervention Group.

Pain: Reduced levels of pain appeared in Intervention Group subjects who worked part-time or did not work, whereas

improvement in pain occurred with Comparison Group subjects who worked full and part-time.

Somatization: Only subjects from the Intervention Group who worked full-time showed improvement, whereas Comparison Group subjects from all three employment situations showed better mean scores.

Pain-Locus-of-Control-A: Intervention Group subjects who worked full-time showed improvement, as did Comparison Group subjects who did not work.

Pain-Locus-of-Control-B: Only Intervention Group subjects who did not work showed improvement.

No particular pattern of differential improvement appeared when comparing the employment situations. Subjects working part-time showed the least improvement within the Intervention Group.

4.3 Summary of results

The results constitute the quantitative evaluation of the support group for injured workers program. The subjects were not considered a sample of a larger population, thus these results were only descriptive of the study population.

The equivalency between the Intervention Group and the Comparison Group was most challenged by the fact that the overall well-being of Comparison Group subjects was better than that of the Intervention Group subjects. In terms of

demographic characteristics, both groups had similar sex, age, time since injury and location of injury distributions. They were, however, dissimilar on the other variables. Proportionally more Intervention Group subjects were not married and were under chronic pain treatment. Similarly, more Comparison Groups subjects had more than grade 12 education and were working full-time or part-time.

The comparison between Intervention Group subjects and Attrition Group subjects did not suggest substantial differences in demographic characteristics, with the exception that married subjects and those with less than grade 12 education appeared more likely to leave the group. In terms of baseline dependent variables, Attrition Group subjects appeared to be suffering less pain and seemed to accept more responsibility for the management of their pain. These two factors could have influenced the attrition.

The overall mean score results (Table 10) indicated that no noticeable improvement occurred among Intervention Group subjects immediately after intervention. Slightly better scores appeared in depression, pain and somatization. However, three months after the intervention, only depression maintained its improvement. Thus, contrary to what was hypothesized, participants in the support groups did not clearly improve in their levels of pain, depression, somatization and pain-locus-of-control.

Comparison Group subjects' overall mean scores (Table 10) showed slightly worse scores on all variables except somatization. Since these differences were slight, the results suggest that Comparison Group subjects did not change in their levels of pain, depression, somatization and pain-locus-of-control. This corresponds to what was the hypothesis for Comparison Group subjects.

The stratified analysis suggested that age, length of time since injury and educational level could have played important roles as confounding factors. When taking into account age, younger subjects from both the Intervention and the Comparison Group seemed to have improved in most variables. As well, subjects from both groups who had longer length of time since injury showed less improvement in depression, pain and somatization. When stratifying by educational level, Intervention Group subjects with less than grade 12 education showed improvement in all variables except somatization. The remaining strata did not show clear general patterns.

In summary, the results did not confirm the hypothesis that Intervention Group subjects would show improvement in their levels of depression, pain, somatization and pain-locus-of-control, after participating in support groups.

4.4 Discussion

The results seemed to suggest that participation in the support groups did not affect the well-being of injured workers with musculoskeletal injuries, in terms of reducing their levels of pain, somatization and depression, and/or increasing their pain-locus-of-control. The results are descriptive of the population that participated in the study.

Despite the fact that the Intervention and Comparison Group participants were not equivalent, the use of two groups allowed for a comparison of results. The results indicated a slight overall improvement of Intervention Group subjects and a slight overall worsening of Comparison Group subjects. However, the differences are too minor to suggest a real intervention effect. As well, the high variability in scores within both groups suggested that injured workers with musculoskeletal injuries showed very different levels of suffering in pain, depression, somatization and pain-locus-of-control. This indicated a limitation which should be considered in future research. It would be beneficial for study purposes to organize groups of injured workers on the basis of similar levels of well-being.

The fact that the results did not suggest improvement, did not necessarily rule out any beneficial effects of participating in the support groups. Several factors may have limited the possibility of detecting the changes.

Firstly, the size of the effect could be very small. Therefore, together with the difficulty of separating confounding factors (due to the already mentioned inherent limitations of a field study), and the imperfection of the instruments, the intervention effect could have gone undetected.

Secondly, the study only inquired into certain well-being indicators. Participation in support groups may very well have had an impact on well-being variables not within the scope of this evaluation.

The stratified analyses appeared to confirm age, length of time since injury and educational level as the most important confounding factors. As common sense would suggest, younger subjects showed more improvement than older participants. As well, the lack of improvement in subjects with longer lengths of injury could indicate that the longer the chronicity, the more difficult the possibility of improvement. The fact that subjects with lower educational levels appeared to have benefited most from the support groups could suggest that these workers were more socially isolated after their injury. Thus, the social support offered by the group may have helped them reduce their isolation. However, the minor differences in mean scores and the high variability of scores, even within each stratum, limit these speculations.

In summary, the quantitative evaluation of the support group program did not show a noticeable improvement in the participants of the program.

CHAPTER 5

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

5.1 Summary of the study

This thesis presents the results of an evaluation of a support group program for injured workers with musculoskeletal injuries. The objective of the study was to investigate whether participation in support groups improved the well-being of injured workers in terms of reducing their levels of pain, somatization and depression, and/or increasing their pain-locus-of-control.

Injured workers with musculoskeletal injuries not only suffer physically, but also emotionally and socially. These emotional and social factors favour a tendency towards chronicity. The human and economic costs of chronicity are high for workers, employers, compensation agencies, and the health care system. A low cost intervention such as a support group program which may arrest this tendency, would be highly beneficial.

A previous study of a rehabilitation program for Workers' Compensation recipients in Newfoundland suggested that the program may have had beneficial effects due largely to group processes and social factors (Hannah, et al., 1988). Related evaluative research on support groups for injured workers, however, appeared to be almost non-existent. The support group program organized by the Occupational Health Program, Faculty

of Medicine, University of Alberta, provided an opportunity to conduct this type of evaluative research. If the evaluation showed improvement among participants, it would provide some evidence to support the efficacy of support groups for injured workers.

The support group program was held between October 1992 and March 1994. A total of 62 subjects completed the support group program. The evaluation employed a type of quasi-experimental design, a Nonequivalent Control Group Design. A comparison group with 40 subjects was thus created. Due to several limitations, the study only pursued exploratory descriptive analysis.

5.2 Major Findings

- a) The injured workers that participated in the support groups did not show noticeable improvements in their well-being (pain, depression, somatization and pain-locus-of-control) immediately after their participation, nor three months afterwards;
- b) The injured workers that did not participate in the support groups did not show noticeable change in their well-being (pain, depression, somatization and pain-locus-of-control) eight weeks after the first measurement, nor twelve weeks after the second measurement;

c) Age, length of time since injury and educational level appeared to be the most noticeable factors that could have contributed to the improvement, or lack of improvement, of the injured workers that participated in the study.

5.3 Conclusions

In terms of the outcome variables chosen to evaluate the effect of support groups on injured workers, the results showed no noticeable improvement in the participants of this program. The study did not demonstrate that these groups are of assistance in reducing factors that delay the recovery of injured workers.

The study is original in that no published research that inquires into the benefits of support groups for injured workers has been located. The study presents a model for a quantitative evaluation which can be used for similar programs. As well, it suggests which significant confounding variables and sources of bias should be considered when designing a future evaluation for this type of program.

The outstanding question remains: Why did participation in support groups apparently produce no effect? Essentially, if the central problem can be attributed either to the intervention effect not having been detected, or to the fact that support groups are not beneficial. The speculative answers to this question can be grouped in two areas: 1)

methodological limitations of the evaluation, and 2) content of the support group program.

1) The overall methodological limitations have been previously addressed. The results have only focused on describing the study population (not considering it a sample of a larger population), and this population did not show noticeable change. The outstanding issues to consider are:

- a) whether change might have occurred on variables different to the ones chosen for study (e.g. social integration, perceived sense of well-being, understanding of their injuries, revisits to physicians, etc.);
- b) given the imperfection of measurement instruments in social sciences and the presence of uncontrollable "noise", a small size effect could very well have gone undetected;
- c) this study did not analyze qualitative information, which poses the risk of reductionism.

2) Assuming that in effect the support groups did not produce any beneficial positive change, the content and dynamics of the support groups must be questioned. There are several possibilities for explaining this phenomenon:

- a) support groups for injured workers with musculoskeletal injuries which do not include physical therapies or exercise do not produce positive effects;
- b) the support groups of this particular program under evaluation were too short to enable positive change to take

place (eight weekly sessions of two hours each may be too short considering the inherent difficulties of chronicity);
c) the dynamics of the groups in this program may not have been appropriate for injured workers with musculoskeletal injuries.

Although it is difficult to arrive at definitive answers, further research into the support groups (groups sessions were audiotaped) could provide some insights for further inquiry.

5.4 Recommendations

1) It is recommended that support groups for injured workers continue to be organized, for the following reasons:

a) The 5.4% participation rate in the support groups of individuals invited from WCB lists seemed to show a need for this type of resource. 5.4% is not a low rate if it is taken into account that WCB identifies 10% of their claimants as chronic after 90 days. Almost 80% of support group participants were not working at the start of the group, thus falling into the 10% of claimants that WCB identifies as chronic. As indicated by the inclusion criteria, the support groups were directed at these workers. This participation rate seems to suggest a need for support groups.

b) The vast use of support groups in other areas of health care suggests that this is a valid alternative resource for recovery.

c) The themes and contents of the support groups for injured workers suggested that the groups were an appropriate setting for these workers in which to share and confront their experience.

d) Further research in support groups for injured workers is needed to assess their impact in the well-being of the participants.

2) It is recommended that future support groups continue to include an evaluative research component. A similarly designed quantitative evaluation could be used given that randomized studies are not deemed possible, and that the shortcomings of the evaluation identified by the thesis can be of use to improve future evaluative research.

a) For research purposes it would be better to create separate groups with similar strata. For example subjects with similar levels of pain and/or depression or similar types of injuries; or subjects of the same sex or of similar age groups, etc. The risk this poses is of excessively homogenizing the groups. A certain degree of heterogeneity of these variables is important for reasons of group dynamics. A stratified analysis is the second best option, if the number of subjects is sufficient.

b) A quantitative satisfaction assessment by group participants should be included in the evaluation, in order to obtain data on their perception of the support group.

c) A qualitative research evaluation should complement the quantitative study.

REFERENCES

- Ahles, T.A., Yunus, M.B., and Masi, A.T. (1987) Is chronic pain a variant of depressive disease? The case of primary fibromyalgia syndrome. Pain 29:105-111.
- Alleyne, B & Kanji, N. (1993) Epidemiological monitoring of claims for musculoskeletal injuries submitted to the Workers Compensation Board. WCB Internal Document.
- Barnes, D., Smith, D., Gatchel, R.J., and Mayer, T.G. (1989) Psychosocioeconomic predictors of treatment success/failure in chronic low-back pain patients. Spine 14:427-430.
- Beck, R.J. (1989) A survey of injured workers outcomes in Wisconsin. J Appl Rehab Counselling 20:20-24.
- Biggs, J.T., Wylie, L.T., and Zeigle, V.E. (1978) Validity of the Zung Self-rating Depression Scale. Br J Psychiat 132:381-385.
- Bigos, S.J.; Baker, R., Lee, S., and Vaegter, K. (1994) Back injury compensation: overcoming an adversarial system. Journal of Musculoskeletal Medicine, 11(6): 17-20, 22, 24.
- Bradley, L.A., Anderson, K.O., Young, L.D., and Williams, T. (1989) Psychological testing. In C.D. Tollison (Ed.) Handbook of Chronic Pain Management. Baltimore: Williams & Wilkins.
- Brown, G.K.; Wallston, K.A.; Nicassio, P.M. (1989) Social support and depression in rheumatoid arthritis: A one year prospective study. Journal of Applied Social Psychology, 19(14) 1164-1181.
- Campbell, D.T. & Stanley, J.C. (1963) Experimental and Quasi-experimental Designs for Research. Chicago:Rand McNally.
- Caplan, R.D. (1979) Patient, provider and organization: Hypothesized determinants of adherence. In S.J. Cohen (Ed.), New directions in patient compliance. Lexington, Mass.: D.C. Heath.
- Caplan, R.D.; Robinson, E.A.R., French, J.R.P., Jr., Caldwell, J.R., and Shinn, M. (1976) Adherence to medical regimens: Pilot experiments in patient education and social support. University of Michigan: Research Center for Group Dynamics, Institute for Social Research.

- Cardoret, R.T., Widmer, R.B., and Troughton, E.P. (1980) Somatic complaints: Harbinger of depression in primary care. J Affect Disord 2:61-70.
- Carroll, B.J., Fielding, J.M., and Blashki, T.G. (1973) Depression rating scales: A critical review. Arch Gen Psychiat 28:361-366.
- Carveth, W.B. & Gottlieb, B.H. (1979) The measurement of social support and its relation to stress. Canadian Journal of Behavioral Science, 11, 179-188.
- Cassel, J. (1974a) An epidemiological perspective of psychosocial factors in disease etiology. American Journal of Public Health, 64, 1040-1043.
- Cassel, J. (1974b) Psychosocial processes and "stress": Theoretical formulation. International Journal of Health Services, 4, 471-482.
- Chapman, C.R.; Casey, K.L.; Dubner, R.; Foley, K.M.; Gracely, R.H.; Reading, A.E. (1985) Pain measurement: an overview. Pain 22 1-31.
- Chapman, C.R. and Turner, J.A. (1986) Psychological control of acute pain in medical settings. J Pain Sympmt Manag 1:9-20.
- Chen, E. and Cobb, S. (1960) Family structure in relation to health and illness: A review of the literature. Journal of Chronic Diseases, 12, 544-567.
- Cobb, S. (1979) Social support and health through the life course. In M.W. Riley (Ed.), Aging from birth to death: Interdisciplinary perspectives. Washington, D.C.: American Association for the Advancement of Science.
- Cobb, S. (1976) Social support as a moderator of life stress. Psychosomatic Medicine, 38(5) 300-314.
- Conger, J.C., Sawrey, W., and Turrel, E.S. (1958) The role of social experience in the production of gastric ulcers in hooded rats placed in a conflict situation. Journal of Abnormal Psychology, 57, 214-220.
- Cook, J.D. & Bickman, L. (1990) Social support and psychological symptomatology following a natural disaster. Journal of Traumatic Stress, 3(4) 541-556.
- Cook, T.D. & Campbell, D.T. (1979) Quasi-Experimentation. Design & analysis issues for field settings.

Crook, J. & Tunks, E. (1985) Defining the 'chronic pain syndrome': An epidemiological method. Clin. J. Pain, 1:159-163.

Davis, J.M.; Hoshiko, B.R; Jones, S.; Gosnell, D. (1992) The effect of a support group on grieving individuals' levels of perceived support and stress. Archives of Psychiatric Nursing, 6(1):35-39.

Dean, A. and Lin, D. (1977) The stress-buffering role of social support: Problems and prospects for systematic investigation. Journal of Nervous and Mental Disease, 165, 403-417.

Dorland's illustrated medical dictionary (1994) 28 edition. Philadelphia: W.R. Saunders Co.

Elliot, D.J., Trief, P.M., and Stein, N. (1986) Mastery, stress, and coping marriage among chronic pain patients. J Behav Med 9:549-558.

Fabrega, H. (1990) The concept of somatization as a cultural and historical product of western medicine. Psychosomatic Med 52:653-672.

Faucett, J.A. & Levine, J.D. (1991) The contributions of interpersonal conflict to chronic pain in the presence or absence of organic pathology. Pain, 44(1) 35-43.

Fleming, A.S., Klein, E., and Corter, C. (1992) The effects of a social support group on depression, maternal attitudes and behavior in new mothers. Journal of Child Psychology & Psychiatry & Allied Disciplines, 33(4):685-698.

Frederickson, B.E., Trief, P.M., VanBeveren, P., Yuan, H.A., and Baum, G. (1988) Rehabilitation of the patient with chronic back pain. Spine, 13:351-353.

Friedman, S.H. (1988) The concept of "Marginality" applied to psychosomatic medicine. In Psychosomatic Medicine 50:447-453.

Gelein, J.L. (1980) The aged American female. Journal of Gerontological Nursing, 6, 69-73.

Gil, K.M.; Keefe, F.J.; Crisson, J.E.; Van Dalftsen, P.J. (1987) Social support and pain behavior. Pain, 29:209-217.

Gildenberg, P.L. & DeVaul, R.A. (1985) The chronic pain patient. Evaluation and management. London: Karger.

- Gore, S. (1984) Stress-buffering effects of social support: An appraisal and clarification of research models. In B.S. Dohrenwend and B.P. Dohrenwend (Eds.), Stressful life events and their contexts (pp. 202-222). New Brunswick, N.J.: Rutgers University Press.
- Gottlieb, B.J. (1986) Put them together and what have you got? Journal of Specialists in Group Work, 11(2):121-127.
- Guidotti, T.L. (1992) Clinical evaluation of occupational disorders. Unpublished manuscript.
- Haggerty, R.H.J. (1980) Life stress, illness and social support. Developmental Medicine and Child Neurology, 22, 391-400.
- Hallgren, L. (1988) The role of formal and informal social support in advanced cancer patient well-being. Ph.D. Thesis. Department of Sociology. University of Alberta.
- Hamburg, B.A., and Killilea, M. (1979) Relation of social support, stress, illness, and use of health services. In Healthy people: The surgeon general's report on health promotion and disease prevention. Background Papers. Washington, D.C.: U.S. Government Printing Office.
- Hannah, T.E., Hannah, E.; Mosher, D. and Vardy, L. (1988) Perceived benefits of a lifestyles modification programme in the rehabilitation of Workers' Compensation recipients. Canadian Journal of Public Health, 79, 323-326.
- Hester, E.J. and Decelles, P.G. (1989) Analysis of Alberta Workers' Compensation claimants with the Menninger Return to Work Scale. Topeca, The Menninger Foundation.
- Hoaglund, F. (1990) Musculoskeletal injuries. In Occupational Medicine, Joseph LaDou (ed), USA.
- Hopmeyer, E. & Werk, A. (1994) A comparative study of family bereavement groups. Death Studies, 18(3): 243-256.
- Jagede, R.O. (1976) Psychometric properties of the Self-rating Depression Scale (SDS). J Psychol 93:27-30.
- Jamison, R.N & Virts, K.L. (1990) The influence of family support on chronic pain. Behaviour Research and Therapy, 28(4), 283-287.
- Katon, W., Ries, R.K. and Kleinman, A. (1984) The prevalence of somatization in primary care. Compare Psychiatry 25:208-215.

Kaplan, B.H.; Cassel, J.C. & Gore, S. (1977) Social support and health. Medical Care, 15(5), 47-58.

Lin, N; Dean, A., & Ensel, W.M. (1981) Social support scales: A methodological note. Schizophrenia Bulletin, 7, 73-89.

Lowenthal, M. & Haven, C. (1968) Interaction and adaptation: Intimacy as a critical variable. American Sociological Review, 33, 20-30.

Magni, G., de Bertolini, C., Dodi, G., and Infantino, A. (1986) Psychological findings in chronic anal pain. Psychopathology 19:170-174.

Main, C.J. (1988) The Pain Locus of Control Questionnaire: Recent Developments. Poster session, CPS/APS Joint Meeting. Toronto.

Main, C.J. (1983) The modified somatic perception questionnaire (MSPQ). J Psychosomatic Res 27: 503-514.

Main, C.J. and Parker, H. (1989) Pain management programs. In M. Roland and J. Jenner (Eds). Back Pain: New approaches to rehabilitation and education. Manchester: Manchester University Press.

Main, C.J. and Waddell, G. (1991) A comparison of cognitive measures and low back pain: statistical structure and clinical validity at initial assessment. Pain 46:287-298.

Melzack, R. (1975) The McGill Pain Questionnaire: major properties and scoring methods. Pain 1:277-299.

Mitchell, R.E. and Trickett, E.J. (1980) Task force report: Social networks as mediators of social support: An analysis of the effects and determinants of social networks. Community Mental Health Journal, 16, 27-44.

Murawski, B.J.; Penman, D., and Schmitt, M. (1978) Social support in health and illness: The concept and its measurement. Cancer Nursing, 365-371.

Nagy, V.T. and Wolfe, G.R. (1983) Chronic illness and health locus of control beliefs. J Soc Clin Psychol 1:58-65.

O'Leary, A., Shoor, S., Lorig, K., and Holman, H.R. (1988) A cognitive behavior treatment for rheumatoid arthritis. Health Psychol 7:527-544.

Ong, Y.L.; Martineau, F.; Lloyd, C.; Robbins, I. (1987) A support group for the depressed elderly. International Journal of Geriatric Psychiatry, 2(2): 119-123.

Parsons, T. (1979) Definitions of health and illness in the light of American values and social structure. In Patients, Physicians, and Illness, 3d edition. Jaco, G. (Ed). New York: The Free Press.

Pender, N.J. (1985) Effects of progressive muscle relaxation training on anxiety and health locus of control among hypertensive adults. Res Nurs Hlth 8:627-633.

Pilowsky, I. (1988) Affective disorders and pain. In Rubner, R.; Gebhart, G.; and Bond, M.; eds. Pain research and clinical management, vol. 3. Amsterdam: Elsevier.

Robertshaw, C. (1992) The government perspective. Alberta Occupational Health Society Conference on Musculoskeletal Injury Prevention. November. Pg. 17.

Rotter, J.B. (1966) Generalized expectancies for internal versus external control reinforcements. Psychological Monographs 80 (1) Whole No. 609.

Roy, R. (1992) The social context of the chronic pain sufferer. Toronto: University of Toronto Press.

Schwartzberg, S.L. (1994) Helping factors in a peer-developed support group for persons with head injury: Participant observer perspective. American Journal of Occupational Therapy, 48(4):297:304.

Seidel, L.F., Gorsky, R.D., Lewis, J.B. and Pearson, D.A. (1992) Integrating a curriculum: The role and function of a capstone course. The Journal of Health Administration Education, 10(2):211-227.

Shaw, L. and Ehrlich, A. (1987) Relaxation training as a treatment for chronic pain caused by ulcerative colitis. Pain 29:287-293.

Shultz, R. (1976) Effects of control and predictability on the physical and psychological well-being of the institutionalized aged. Journal of Personality and Social Psychology, 33, 563-573.

Skinner, J.B., Erskins, A., Pearce, S.A., and Rubenstein, I. (1990) The evaluation of a cognitive behavioral treatment program in outpatients with chronic pain. J Psychosomatic Res 34:13-19.

Spiegel, D. (1992) Effects of psychosocial support on patients with metastatic breast cancer. Journal of Psychosocial Oncology, 10(1) 113-120.

Sternbach, R. (1974) Pain patients: Traits and treatment. New York: Academic Press.

Tedeschi, R.G & Calhoun, L.G. (1993) Using the support group to respond to the isolation of bereavement. Journal of Mental Health Counseling, 15(1):47-54.

Thoits, P.A. (1982) Conceptual, methodological, and theoretical problems in studying social support as a buffer against life stress. Journal of Health and Social Behavior, 23: 145-159.

Turner, J.B.; Kessler, R.C.; House, J.S. (1991) Factors facilitating adjustment to unemployment: Implications for intervention. Special Issue: Preventive intervention research centers. American Journal of Community Psychology, 19(4), 521-542.

Voaklander, D.C. (1992) Research project: Support group for injured workers. Evaluation methods. Un-published paper.

Vugia, H.D. (1991) Support groups in Oncology: Building hope through human bond. Journal of Psychosocial Oncology, 9(3):89-107.

Wallston, B.S.; Alagna, S.W.; De Vellis, B.M. & De Vellis, R.F. (1983) Social support and physical health. Health Psychology, 2(4), 367-391.

Wortman, C. (1984) Social support and the cancer patient: Conceptual and methodological issues. Cancer, 53 (Supplement), 2339-2360.

Zung, W.W.K. (1972) The depression status inventory: An adjunct to the Self-rating Depression Scale. J Clin Psychol 28:193-194.

Zung, W.W.K. (1969) A cross-cultural survey of symptoms in depression. Am J Psychiat 126:116-121.

Zung, W.W.K. (1965) A self-rating depression scale. Arch Gen Psychiat, 12:63-70.

APPENDIX A

SUPPORT GROUP FOR INJURED WORKERS
WITH MUSCULOSKELETAL INJURIES

Environmental and Occupational Health Programs
Faculty of Medicine
University of Alberta

Inclusion criteria

Musculoskeletal disorders
(back, upper and lower extremity disabilities)

Temporary or chronic disability

3 to 36 months since onset of injury

Greater Edmonton Region
(Within a 1 hour driving radius of Edmonton)

Exclusion criteria

Other serious health problems
(e.g. cancer, insulin dependent diabetes, etc.)

Serious mental disorders
(e.g. psychosis, history of mental instability, very severe depression,
history of aggressive behaviour, active alcohol or drug addiction)

For further information please contact
Javier Mignone, Support Group Coordinator.
(403) 492-7848
Fax (403) 492-0364

APPENDIX B

INSTRUCTIONS:

Please circle the word in each category that most accurately describes the pain that you feel at this moment. If no word applies in a category, do not choose one from that category.

1 Flickering Quivering Pulsing Throbbing Beating Pounding	8 Tingling Itchy Smarting Stinging	15 Wretched Blinding
	9 Dull Sore Hurting Aching Heavy	16 Annoying Troublesome Miserable Intense Unbearable
2 Jumping Flashing Shooting		17 Spreading Radiating Penetrating Piercing
3 Pricking Boring Drilling Stabbing Lancinating	10 Tender Taut Rasping Splitting	18 Tight Numbing Drawing Squeezing Tearing
	11 Tiring Exhausting	
4 Sharp Cutting Lacerating	12 Sickening Suffocating	19 Cool Cold Freezing
	13 Fearful Frightful Terrifying	
5 Pinching Pressing Gnawing Cramping Crushing	14 Punishing Gruelling Cruel Vicious Killing	20 Nagging Nauseating Agonizing Dreadful Torturing
6 Tugging Pulling Wrenching		
7 Hot Burning Scalding Searing		

APPENDIX C

INSTRUCTIONS:

Please describe how you have felt during the PAST WEEK by making an (X) in the box that best describes your feelings. Please answer all questions. Do not think too long before answering.

	Not at all	A little/ slightly	A great deal Quite a bit	Extremely/ could not have been worse
Heart rate increase				
Feeling hot all over				
Sweating all over				
Sweating in a particular part of the body				
Pulse in neck				
Pounding in head				
Dizziness				
Blurring of vision				
Feeling faint				
Everything appearing unreal				
Nausea				
Butterflies in stomach				
Pain or ache in stomach				
Stomach churning				
Desire to pass water				
Mouth becoming dry				
Difficulty swallowing				
Muscles in neck aching				
Legs feeling weak				
Muscles twitching or jumping				
Tense feeling across forehead				
Tense feeling in jaw muscles				

APPENDIX D

INSTRUCTIONS:

Please rate each statement by marking an (X) in the box which best shows how much you currently feel the statement applies to you.

1.	I need my medication to control my pain.			
	☐	☐	☐	☐
	Very True	Somewhat True	Somewhat Untrue	Very Untrue
2.	My pain will often go away if I let myself relax physically.			
	☐	☐	☐	☐
	Very True	Somewhat True	Somewhat Untrue	Very Untrue
3.	I can make my pain decrease if I concentrate on pain-free parts of my body.			
	☐	☐	☐	☐
	Very True	Somewhat True	Somewhat Untrue	Very Untrue
4.	I need the help of others to control my pain.			
	☐	☐	☐	☐
	Very True	Somewhat True	Somewhat Untrue	Very Untrue
5.	Only I can help myself with my pain.			
	☐	☐	☐	☐
	Very True	Somewhat True	Somewhat Untrue	Very Untrue
6.	My pain level will go down if I remain passive and don't respond to it.			
	☐	☐	☐	☐
	Very True	Somewhat True	Somewhat Untrue	Very Untrue
7.	My doctors can help me with my pain.			
	☐	☐	☐	☐
	Very True	Somewhat True	Somewhat Untrue	Very Untrue
8.	Sometimes I can reduce my pain by not paying attention to it.			
	☐	☐	☐	☐
	Very True	Somewhat True	Somewhat Untrue	Very Untrue
9.	I am responsible for how pain affects me.			
	☐	☐	☐	☐
	Very True	Somewhat True	Somewhat Untrue	Very Untrue

10. I can make pain go away by believing it will go away.
- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| ☐ | ☐ | ☐ | ☐ |
| Very
True | Somewhat
True | Somewhat
Untrue | Very
Untrue |
11. My pain just comes and goes, regardless of what I do or think.
- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| ☐ | ☐ | ☐ | ☐ |
| Very
True | Somewhat
True | Somewhat
Untrue | Very
Untrue |
12. My pain will decrease if I think of things going on around me.
- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| ☐ | ☐ | ☐ | ☐ |
| Very
True | Somewhat
True | Somewhat
Untrue | Very
Untrue |
13. Being in pain is never my choice.
- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| ☐ | ☐ | ☐ | ☐ |
| Very
True | Somewhat
True | Somewhat
Untrue | Very
Untrue |
14. I can reduce my pain if I imagine a situation in which I have been pain-free in the past.
- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| ☐ | ☐ | ☐ | ☐ |
| Very
True | Somewhat
True | Somewhat
Untrue | Very
Untrue |
15. Medication helps me control my pain.
- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| ☐ | ☐ | ☐ | ☐ |
| Very
True | Somewhat
True | Somewhat
Untrue | Very
Untrue |
16. My pain will get better if I think of pleasant thoughts.
- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| ☐ | ☐ | ☐ | ☐ |
| Very
True | Somewhat
True | Somewhat
Untrue | Very
Untrue |
17. My pain is out of control.
- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| ☐ | ☐ | ☐ | ☐ |
| Very
True | Somewhat
True | Somewhat
Untrue | Very
Untrue |
18. Just slowing down and regulating my breathing pattern often helps my pain.
- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| ☐ | ☐ | ☐ | ☐ |
| Very
True | Somewhat
True | Somewhat
Untrue | Very
Untrue |
19. I can sometimes reduce pain by imagining that the pain I feel is really pleasant stimulation.
- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| ☐ | ☐ | ☐ | ☐ |
| Very
True | Somewhat
True | Somewhat
Untrue | Very
Untrue |

APPENDIX E

INSTRUCTIONS:

Please indicate for each of these questions (X) which answer best describes how you have been feeling recently.

	Rarely or none of the time (less than 1 day per week)	Some or little of the time (1-2 days per week)	A moderate amount of time (3-4 days per week)	Most of the time (5-7 days per week)
1. I feel downhearted or sad				
2. Morning is when I feel best				
3. I have crying spells or feel like it				
4. I have trouble getting to sleep at night				
5. I feel that nobody cares				
6. I eat as much as I used to				
7. I still enjoy sex				
8. I noticed I am losing weight				
9. I have trouble with constipation				
10. My heart beats faster than usual				
11. I get tired for no reason				
12. My mind is as clear as it used to be				
13. I tend to wake up too early				
14. I find it easy to do the things I used to				
15. I am restless and can't keep still				
16. I feel hopeful about the future				
17. I am more irritable than usual				
18. I find it easy to make a decision				
19. I feel quite quilty				
20. I feel that I am useful and needed				
21. My life is pretty full				
22. I feel that others would be better off if I were dead				
23. I am still able to enjoy the things that I used to				

APPENDIX F

PLEASE PRINT

CODE NUMBER _____

DATE _____

1. What is your present marital status?

- ☐ married, never divorce
- ☐ remarried
- ☐ common-law
- ☐ widowed
- ☐ separated
- ☐ divorced
- ☐ never married

2. Are you currently being treated for chronic pain by someone other than your family physician?

____yes____no

3. If you answered yes to question #2, where are you receiving treatment for chronic pain?

4. What is your present employment status?

- ☐ not working
- ☐ working part-time
- ☐ working full-time

ENVIRONMENTAL AND OCCUPATIONAL HEALTH PROGRAMS (403) 492-7848

PLEASE PRINT

NAME _____

ADDRESS _____

PHONE NUMBER _____

1. Age _____

2. _____ Male _____ Female

3. What is your marital status?

- ☐ married, never divorced
- ☐ remarried
- ☐ common-law
- ☐ widowed
- ☐ separated
- ☐ divorced
- ☐ never married

4. How many children do you have?

5. What is your education level?

- ☐ less than grade 9
- ☐ less than grade 12
- ☐ grade 12
- ☐ technical training
- ☐ some university/college
- ☐ university degree

6. If you are married or living common-law, does your spouse work?

_____ yes _____ no _____ does not apply

7. What was your occupation when you were injured?

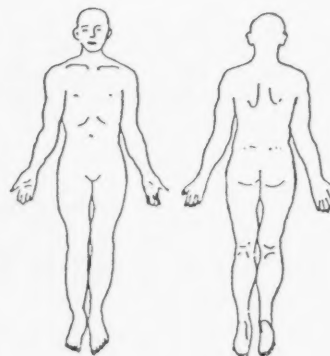
8. When you are rehabilitated do you expect to be able to return to the employer you had at the time of injury?

_____ yes _____ no

9. What was the date of your injury?

_____ day _____ month _____ year

10. Please identify the part(s) of your body that continue to cause you pain or disability as a result of your injury.



11. Are you currently being treated for chronic pain by someone other than your family physician?

_____ yes _____ no

12. If you answered yes to question #11, where are you receiving treatment for chronic pain?

13. Are you currently receiving any type of psychiatric care?

_____ yes _____ no

APPENDIX G

ENVIRONMENTAL AND OCCUPATIONAL HEALTH PROGRAMS (403) 492-7848
CONSENT FORM

I, _____, hereby consent to voluntarily participate in support group meetings for injured workers organized by the Occupational Health Program at the University of Alberta, not holding anyone else responsible for this decision and its consequences.

For the purposes for research and evaluation, I consent that the meetings be recorded on audio devices without breach of confidentiality. This means that no information will be released about any individual in the group in a way that their identity could be recognized. Access to personal information and recordings of these sessions will be restricted to authorized professionals only.

I hereby consent to having information from group meetings be used for research, evaluation, and publication purposes, without breach of confidentiality.

I acknowledge that the procedures described on the Information Sheet and of which I have a copy have explained to me, and that any questions that I have asked have been answered to my satisfaction. In addition, I know that I may contact the person designated on this form, If I have further questions either now or in the future. I have been assured that personal records relating to this study will be kept confidential. I understand that I am free to withdraw from the group at any time without penalty. I understand that if any knowledge gained from the group is forthcoming that could influence my decision to continue in this group, I will be promptly informed.

The person who may be
contacted about this
project is:

Mr. Javier Mignone
Telephone (403) 492-7848

(Name)

(Signature of subject, or person
authorized to sign on behalf of the
subject, eg. spouse)

(Witness Name)

(Signature of Witness)

(Date)

Signature of Investigator or Designee

APPENDIX H

TABLE 6.1
INTERVENTION GROUP
AGE-GROUPS BY SEX
 # (%) n=62)

	FEMALE	MALE
20-29	2 (3.2)	1 (1.6)
30-39	11 (17.7)	7 (11.3)
40-49	10 (16.1)	9 (14.5)
50-59	10 (16.1)	7 (11.3)
60-69	3 (4.8)	2 (3.2)

Chi-Square (p-value = .98233)

TABLE 6.2
INTERVENTION GROUP
EDUCATIONAL LEVEL BY WORKING STATUS AT START OF GROUP
 # (%) n=62)

	FULL-TIME	PART-TIME	NOT WORKING
< GRADE 12	0 (0.0)	2 (3.2)	15 (24.2)
GRADE 12	4 (6.5)	1 (1.6)	13 (21)
> GRADE 12	5 (8.1)	2 (3.2)	20 (32.3)

Chi-Square (p-value= .36638)

TABLE 6.3
INTERVENTION GROUP
CHRONIC PAIN TREATMENT BY WORKING STATUS AT START OF GROUP
 # (%) n=62)

	FULL-TIME	PART-TIME	NOT WORKING
YES	8 (12.9)	1 (1.6)	20 (32.3)
NO	1 (1.6)	4 (6.5)	28 (45.2)

Chi-Square (p-value= .01534)

TABLE 6.4
INTERVENTION GROUP
TIME SINCE INJURY BY WORKING STATUS AT START OF GROUP
 # (%) n=62)

	FULL-TIME	PART-TIME	NOT WORKING
3-12 MONTHS	0 (0.0)	1 (1.6)	5 (8.1)
13-24 MONTHS	8 (12.9)	2 (3.2)	28 (45.2)
25-36 MONTHS	1 (1.6)	2 (3.2)	15 (24.2)

Chi-Square (p-value= .36825)

TABLE 6.5
INTERVENTION GROUP
TIME SINCE INJURY BY AGE GROUPS
 # (%) n=62

	3-12 MONTHS	13-24 MONTHS	25-36 MONTHS
20-29	1 (1.6)	2 (3.2)	0 (0.0)
30-39	1 (1.6)	14 (22.6)	3 (4.8)
40-49	3 (4.8)	10 (16.1)	6 (9.7)
50-59	0 (0.0)	10 (16.1)	7 (11.3)
60-69	1 (1.6)	2 (3.2)	2 (3.2)

Chi-Square (p-value = .31414)

TABLE 6.6
INTERVENTION GROUP
TIME SINCE INJURY BY SEX
 # (%) n=62

	FEMALE	MALE
3-12 MONTHS	2 (3.2)	4 (6.5)
13-24 MONTHS	22 (35.5)	16 (25.8)
25-36 MONTHS	12 (19.4)	6 (9.7)

Chi-Square (p-value = .35798)

TABLE 6.7
INTERVENTION GROUP
LOCATION OF INJURY BY SEX
 # (%) n=62

	FEMALE	MALE
UPPER EXTREMITY	19 (30.6)	10 (16.1)
BACK	14 (22.6)	8 (12.9)
LOWER EXTREMITY	3 (4.8)	8 (12.9)

Chi-Square (p-value = .07334)

TABLE 7.1
INTERVENTION GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: SEX
 n=62

	FEMALE	MALE	t-test*
	MEAN	MEAN	p-value
PAIN	35.34	30.44	0.192
SOMATIZATION	10.50	9.96	0.720
LOCUS OF CONTROL A	7.25	7.19	0.966
LOCUS OF CONTROL B	6.92	5.88	0.198
DEPRESSION	29.47	30.44	0.810

* 2-Tailed, Significant at Alpha 0.05

TABLE 7.2
INTERVENTION GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: MARITAL STATUS
 n=62

	MARRIED/CL	SING/SEP/DIV/WID	t-test*
	MEAN	MEAN	p-value
PAIN	32.10	34.04	0.613
SOMATIZATION	9.87	10.53	0.669
LOCUS OF CONTROL A	7.92	6.79	0.416
LOCUS OF CONTROL B	6.88	6.24	0.434
DEPRESSION	26.83	31.68	0.146

* 2-Tailed, Significant at Alpha 0.05

TABLE 7.3
INTERVENTION GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: CHRONIC PAIN TREATMENT
 n=62

	YES	NO	t-test*
	MEAN	MEAN	p-value
PAIN	31.41	34.94	0.344
SOMATIZATION	11.52	9.18	0.113
LOCUS OF CONTROL A	7.48	7.00	0.722
LOCUS OF CONTROL B	6.62	6.36	0.747
DEPRESSION	29.34	30.21	0.792

* 2-Tailed, Significant at Alpha 0.05

TABLE 7.4
INTERVENTION GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: AGE GROUPS

	20-29	30-39	40-49	50-59	60-69	ANOVA*
	MEAN	MEAN	MEAN	MEAN	MEAN	p-value
PAIN	33.41	42.01	27.08	30.64	34.42	0.0265
SOMATIZATION	10.33	11.67	9.84	10.59	5.80	0.3878
LOCUS OF CONTROL A	5.67	9.67	8.21	5.29	2.20	0.0155
LOCUS OF CONTROL B	8.00	7.44	7.21	5.53	2.60	0.0078
DEPRESSION	31.00	33.50	25.89	31.88	20.20	0.2952

* 2-Tailed, Significant at Alpha 0.05

TABLE 7.5
INTERVENTION GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: EDUCATIONAL LEVEL

	<12	12	>12	ANOVA*
	MEAN	MEAN	MEAN	p-value
PAIN	37.24	32.75	31.16	0.4003
SOMATIZATION	10.47	11.28	9.48	0.5930
LOCUS OF CONTROL A	4.53	6.44	9.44	0.0063
LOCUS OF CONTROL B	5.47	7.33	6.56	0.2054
DEPRESSION	34.47	29.78	26.89	0.1585

* 2-Tailed, Significant at Alpha 0.05

TABLE 7.6
INTERVENTION GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: TIME SINCE INJURY

	3-12 M	13-24 M	25-36 M	ANOVA*
	MEAN	MEAN	MEAN	p-value
PAIN	32.25	33.16	33.91	0.9685
SOMATIZATION	13.50	9.61	10.61	0.2998
LOCUS OF CONTROL A	5.00	8.03	6.28	0.2864
LOCUS OF CONTROL B	5.83	6.76	6.11	0.6663
DEPRESSION	36.67	28.21	30.89	0.2962

* 2-Tailed, Significant at Alpha 0.05

TABLE 7.7
INTERVENTION GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: LOCATION OF INJURY

	UPPER MEAN	BACK MEAN	LOWER MEAN	ANOVA* p-value
PAIN	34.91	30.34	34.90	0.5041
SOMATIZATION	11.62	8.41	10.45	0.1440
LOCUS OF CONTROL A	6.07	7.95	8.82	0.2469
LOCUS OF CONTROL B	6.03	6.91	6.82	0.5682
DEPRESSION	29.59	28.00	34.00	0.4471

* 2-Tailed, Significant at Alpha 0.05

TABLE 7.8
INTERVENTION GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: WORKING STATUS AT START OF GROUP

	FT MEAN	PT MEAN	NO MEAN	ANOVA* p-value
PAIN	30.63	33.13	33.80	0.8387
SOMATIZATION	8.89	12.40	10.31	0.5575
LOCUS OF CONTROL A	7.33	10.00	6.92	0.4667
LOCUS OF CONTROL B	8.33	6.80	6.10	0.1336
DEPRESSION	21.78	28.40	31.46	0.1076

* 2-Tailed, Significant at Alpha 0.05

TABLE 8.1
COMPARISON GROUP
AGE GROUPS BY SEX

(%) n=40

	FEMALE	MALE
20-29	3 (7.5)	0 (0.0)
30-39	7 (17.5)	2 (5.0)
40-49	7 (17.5)	5 (12.5)
50-59	9 (22.5)	6 (15.0)
60-69	1 (2.5)	0 (0.0)

Chi-Square (p-value = .52436)

TABLE 8.2
COMPARISON GROUP
EDUCATIONAL LEVEL BY WORKING STATUS AT START OF GROUP

(%) n=40

	FULL-TIME	PART-TIME	NOT WORKING
< GRADE 12	3 (7.5)	2 (5.0)	6 (15.0)
GRADE 12	2 (5.0)	2 (5.0)	2 (5.0)
> GRADE 12	8 (20.0)	7 (17.5)	8 (20.0)

Chi Square (p-value = .83910)

TABLE 8.3
COMPARISON GROUP
CHRONIC PAIN TREATMENT BY WORKING STATUS AT START OF GROUP

(%) n=40

	FULL-TIME	PART-TIME	NOT WORKING
YES	2 (5.0)	2 (5.0)	4 (10.0)
NO	11 (27.5)	9 (22.5)	12 (30.0)

Chi-Square (p-value = .80019)

TABLE 8.4
COMPARISON GROUP
TIME SINCE INJURY BY WORKING STATUS AT START OF GROUP

(%) n=40

	FULL-TIME	PART-TIME	NOT WORKING
3-12 MONTHS	3 (7.5)	1 (2.5)	3 (7.5)
13-24 MONTHS	7 (17.5)	8 (20.0)	8 (20.0)
25-36 MONTHS	3 (7.5)	2 (5.0)	5 (12.5)

Chi-Square (p-value = .77360)

TABLE 8.5
COMPARISON GROUP
TIME SINCE INJURY BY AGE GROUPS
 # (%) n=40

	3-12 MONTHS	13-24 MONTHS	25-36 MONTHS
20-29	2 (5.0)	1 (2.5)	0 (0.0)
30-39	1 (2.5)	6 (15.0)	2 (5.0)
40-49	2 (5.0)	6 (15.0)	4 (10.0)
50-59	2 (5.0)	9 (22.5)	4 (10.0)
60-69	0 (0.0)	1 (2.5)	0 (0.0)

Chi-Square (p-value = .54265)

TABLE 8.6
COMPARISON GROUP
TIME SINCE INJURY BY SEX
 # (%) n=40

	FEMALE	MALE
3-12 MONTHS	5 (12.5)	2 (5.0)
13-24 MONTHS	17 (42.5)	6 (15.0)
25-36 MONTHS	5 (12.5)	5 (12.5)

Chi Square (p-value = .39132)

TABLE 8.7
COMPARISON GROUP
LOCATION OF INJURY BY SEX
 # (%) n=40

	FEMALE	MALE
UPPER EXTREMITY	12 (30.0)	4 (10.0)
BACK	9 (22.5)	5 (12.5)
LOWER EXTREMITY	6 (15.0)	4 (10.0)

Chi Square (p-value = .69329)

TABLE 9.1
COMPARISON GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: SEX
 n=40

	FEMALE	MALE	t-test*
	MEAN	MEAN	p-value
PAIN	17.85	27.19	0.042
SOMATIZATION	6.00	6.54	0.769
LOCUS OF CONTROL A	8.30	8.38	0.971
LOCUS OF CONTROL B	7.81	7.46	0.797
DEPRESSION	17.59	20.54	0.449

* 2-Tailed, Significant at Alpha 0.05

TABLE 9.2
COMPARISON GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: MARITAL STATUS
 n=40

	MARRIED/CL	SING/SEP/DIV/WID	t-test*
	MEAN	MEAN	p-value
PAIN	20.37	34.04	0.899
SOMATIZATION	4.33	10.53	0.243
LOCUS OF CONTROL A	12.00	6.79	0.080
LOCUS OF CONTROL B	11.00	6.24	0.003
DEPRESSION	16.22	31.68	0.491

* 2-Tailed, Significant at Alpha 0.05

TABLE 9.3
COMPARISON GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: CHRONIC PAIN TREATMENT
 n=40

	YES	NO	t-test*
	MEAN	MEAN	p-value
PAIN	31.24	18.30	0.015
SOMATIZATION	5.50	6.34	0.694
LOCUS OF CONTROL A	7.00	8.66	0.565
LOCUS OF CONTROL B	4.88	8.41	0.023
DEPRESSION	23.88	17.22	0.140

* 2-Tailed, Significant at Alpha 0.05

TABLE 9.4
COMPARISON GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: AGE GROUPS
n=40

	20-29	30-39	40-49	50-59	60-69	ANOVA*
	MEAN	MEAN	MEAN	MEAN	MEAN	p-value
PAIN	13.58	19.83	21.73	23.70	0.00	0.4321
SOMATIZATION	6.33	6.22	6.50	6.27	0.00	0.8588
LOCUS OF CONTROL A	9.67	8.78	9.00	6.83	13.00	0.8834
LOCUS OF CONTROL B	8.67	9.33	8.25	5.67	14.00	0.0715
DEPRESSION	19.33	18.78	16.92	20.20	9.00	0.8758

* 2-Tailed, Significant at Alpha 0.05

TABLE 9.5
COMPARISON GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: EDUCATIONAL LEVEL
n=40

	<12	12	>12	ANOVA*
	MEAN	MEAN	MEAN	p-value
PAIN	25.22	21.31	18.7	0.4398
SOMATIZATION	5.45	6.17	6.52	0.8671
LOCUS OF CONTROL A	8.09	8.67	8.35	0.9879
LOCUS OF CONTROL B	7.45	10.00	7.22	0.3130
DEPRESSION	16.91	23.50	18.04	0.5037

* 2-Tailed, Significant at Alpha 0.05

TABLE 9.6
COMPARISON GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: TIME SINCE INJURY
n=40

	3-12 M	13-24 M	25-36 M	ANOVA*
	MEAN	MEAN	MEAN	p-value
PAIN	17.39	22.39	19.88	0.6857
SOMATIZATION	7.29	5.48	7	0.6367
LOCUS OF CONTROL A	11.57	9.39	3.6	0.0379
LOCUS OF CONTROL B	9.14	7.87	6.3	0.3433
DEPRESSION	24.14	15.78	21	0.1721

* 2-Tailed, Significant at Alpha 0.05

TABLE 9.7
COMPARISON GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: LOCATION OF INJURY
n=40

	UPPER MEAN	BACK MEAN	LOWER MEAN	ANOVA* p-value
PAIN	19.67	19.44	24.85	0.5823
SOMATIZATION	5.31	5.79	8.10	0.4162
LOCUS OF CONTROL A	9.13	8.36	7.00	0.7711
LOCUS OF CONTROL B	8.19	7.71	6.90	0.7358
DEPRESSION	16.69	18.79	21.20	0.6234

* 2-Tailed, Significant at Alpha 0.05

TABLE 9.8
COMPARISON GROUP: BASELINE DEPENDENT VARIABLES
COMPARISON OF SUB-GROUPS: WORKING STATUS AT START OF GROUP
n=40

	FT MEAN	PT MEAN	NO MEAN	ANOVA* p-value
PAIN	22.76	20.79	19.43	0.8154
SOMATIZATION	7.15	4.36	6.63	0.4111
LOCUS OF CONTROL A	11.00	7.82	6.50	0.2371
LOCUS OF CONTROL B	9.00	8.36	6.19	0.1360
DEPRESSION	17.23	18.09	19.94	0.8132

* 2-Tailed, Significant at Alpha 0.05

TABLE 11.1
INTERVENTION GROUP
SEX

VARIABLE	FEMALES					
	PRE (N=36)		POST (N=36)		LATE-POST (N=32)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	29.47	14.05	29.36	12.19	27.50	12.07
PAIN	35.34	13.14	33.18	12.66	34.52	13.87
SOMATIZATION	10.50	6.04	10.31	7.37	11.59	8.37
LOCUS CONTROL A	7.25	5.36	6.64	5.78	7.00	5.33
LOCUS CONTROL B	6.92	3.09	6.97	3.80	7.38	2.85

VARIABLE	MALES					
	PRE (N=26)		POST (N=26)		LATE-POST (N=24)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	30.27	10.94	29.04	8.72	29.29	7.87
PAIN	30.44	16.10	30.84	15.40	31.91	14.26
SOMATIZATION	9.96	5.50	10.04	6.34	10.58	6.67
LOCUS CONTROL A	7.19	5.25	6.88	5.44	8.46	5.36
LOCUS CONTROL B	5.88	3.06	5.69	3.10	6.04	2.94

TABLE 11.2
COMPARISON GROUP
SEX

VARIABLE	FEMALE					
	PRE (N=27)		POST (N=27)		LATE POST (N=21)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	17.59	11.64	17.78	10.51	18.86	11.26
PAIN	17.85	12.28	17.11	11.99	15.78	9.92
SOMATIZATION	6.00	5.57	5.04	3.90	6.90	5.42
LOCUS CONTROL A	8.30	6.43	7.22	6.92	6.76	6.34
LOCUS CONTROL B	7.81	3.81	7.30	3.41	6.76	3.27

VARIABLE	MALE					
	PRE (N=13)		POST (N=13)		LATE POST (N=12)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	20.54	10.86	20.77	12.87	21.17	12.81
PAIN	27.19	14.76	29.61	18.00	28.58	17.98
SOMATIZATION	6.54	4.94	7.46	4.37	7.42	5.30
LOCUS CONTROL A	8.38	8.75	7.62	7.74	6.67	7.41
LOCUS CONTROL B	7.46	4.48	6.69	3.97	5.83	3.16

TABLE 12.1
INTERVENTION GROUP
MARITAL STATUS

VARIABLE	MARRIED/COMMON LAW					
	PRE (N=38)		POST (N=38)		LATE-POST (N=33)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	31.68	13.74	30.34	12.47	29.70	11.28
PAIN	34.04	15.69	32.41	14.83	33.75	14.77
SOMATIZATION	10.53	5.64	10.84	7.41	12.09	8.21
LOCUS CONTROL A	6.79	5.41	7.24	5.66	7.52	5.79
LOCUS CONTROL B	6.24	3.08	6.92	3.39	6.45	2.54

VARIABLE	SINGLE/SEPARATED/DIVORCED/WIDOW					
	PRE (N=24)		POST (N=24)		LATE-POST (N=23)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	26.83	10.59	27.46	7.31	26.22	8.92
PAIN	32.10	12.73	31.86	12.29	32.89	13.04
SOMATIZATION	9.88	6.10	9.17	6.01	9.83	6.68
LOCUS CONTROL A	7.92	5.07	5.96	5.50	7.78	4.75
LOCUS CONTROL B	6.88	3.15	5.67	3.74	7.30	3.43

TABLE 12.2
COMPARISON GROUP
MARITAL STATUS

VARIABLE	MARRIED/COMMON LAW					
	PRE (N=31)		POST (N=31)		LATE POST (N=27)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	19.23	11.98	18.87	12.02	20.37	12.25
PAIN	21.04	13.79	21.10	16.36	21.74	15.08
SOMATIZATION	6.71	5.51	5.94	4.26	7.30	5.41
LOCUS CONTROL A	7.26	7.08	7.35	7.15	6.59	6.69
LOCUS CONTROL B	6.74	3.72	6.48	3.34	6.19	3.22

VARIABLE	SINGLE/SEPARATED/DIVORCED/WIDOW					
	PRE (N=9)		POST (N=9)		LATE POST (N=6)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	16.22	8.98	18.33	8.72	16.67	9.07
PAIN	20.37	14.09	21.42	10.99	14.57	11.03
SOMATIZATION	4.33	4.39	5.44	4.03	6.17	5.12
LOCUS CONTROL A	12.00	6.46	7.33	7.35	7.33	6.95
LOCUS CONTROL B	11.00	3.12	9.22	3.67	7.50	3.21

TABLE 13.1
INTERVENTION GROUP
AGE

VARIABLE	AGE GROUP 20-29					
	PRE (N=3)		POST (N=3)		LATE-POST (N=3)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	31.00	4.58	25.67	15.95	21.00	7.21
PAIN	33.41	3.83	32.38	13.49	28.07	7.91
SOMATIZATION	10.33	6.11	5.67	3.79	9.00	3.61
LOCUS CONTROL A	5.67	2.89	4.67	5.03	6.67	3.21
LOCUS CONTROL B	8.00	1.73	5.67	3.51	7.33	2.08

VARIABLE	AGE GROUP 30-39					
	PRE (N=18)		POST (N=18)		LATE-POST (N=15)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	33.50	9.30	30.72	6.75	30.67	7.98
PAIN	42.01	12.73	38.31	12.23	43.08	11.85
SOMATIZATION	11.67	5.86	12.83	6.93	14.27	7.38
LOCUS CONTROL A	9.67	4.64	9.50	5.90	10.00	4.49
LOCUS CONTROL B	7.44	2.15	6.94	3.06	7.87	2.70

VARIABLE	AGE GROUP 40-49					
	PRE (N=19)		POST (N=19)		LATE-POST (N=18)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	25.89	14.12	25.68	11.63	23.39	9.24
PAIN	27.08	13.90	26.25	14.57	28.54	16.51
SOMATIZATION	9.84	6.27	8.21	6.62	8.83	5.89
LOCUS CONTROL A	8.21	5.39	8.16	5.61	9.39	5.75
LOCUS CONTROL B	7.21	3.74	6.53	4.53	7.17	3.29

VARIABLE	AGE GROUP 50-59					
	PRE (N=17)		POST (N=17)		LATE-POST (N=16)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	31.88	12.54	34.65	10.15	35.44	9.11
PAIN	30.64	14.63	31.99	12.70	33.24	10.44
SOMATIZATION	10.59	5.24	11.71	6.38	13.50	8.81
LOCUS CONTROL A	5.29	5.12	4.18	3.84	4.88	4.43
LOCUS CONTROL B	5.53	2.65	6.29	3.20	5.56	2.63

VARIABLE	AGE GROUP 60-69					
	PRE (N=5)		POST (N=5)		LATE-POST (N=4)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	23.60	19.24	21.00	12.06	18.00	11.17
PAIN	34.42	15.60	33.38	15.50	23.60	4.94
SOMATIZATION	5.80	4.76	5.80	7.46	2.25	0.96
LOCUS CONTROL A	2.20	3.35	1.40	2.19	2.50	3.79
LOCUS CONTROL B	2.60	1.82	5.20	3.11	5.75	2.99

TABLE 13.2
COMPARISON GROUP
AGE GROUPS

VARIABLE	20-29					
	PRE (N=3)		POST (N=3)		LATE POST (N=2)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	19.33	13.05	18.33	14.50	17.00	24.04
PAIN	13.58	8.39	17.04	13.30	10.95	8.28
SOMATIZATION	6.33	3.79	7.67	6.81	6.50	6.36
LOCUS CONTROL A	9.67	2.52	9.33	4.51	10.00	7.07
LOCUS CONTROL B	8.67	1.15	9.33	2.08	7.00	1.41

VARIABLE	30-39					
	PRE (N=9)		POST (N=9)		LATE POST (N=5)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	18.78	13.58	16.00	10.98	15.40	12.99
PAIN	19.83	9.82	18.62	10.43	17.55	6.80
SOMATIZATION	6.22	6.67	3.89	2.98	5.60	3.21
LOCUS CONTROL A	8.78	5.97	5.11	4.99	2.60	2.79
LOCUS CONTROL B	9.33	4.82	8.22	3.38	6.20	3.27

VARIABLE	40-49					
	PRE (N=12)		POST (N=12)		LATE POST (N=11)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	16.92	9.71	17.75	10.86	19.27	11.44
PAIN	21.73	16.20	21.12	17.95	23.75	19.16
SOMATIZATION	6.50	5.07	6.67	4.23	8.00	6.08
LOCUS CONTROL A	9.00	8.36	10.58	8.27	8.36	6.38
LOCUS CONTROL B	8.25	3.77	7.92	3.37	7.64	3.85

VARIABLE	50-59					
	PRE (N=15)		POST (N=15)		LATE POST (N=14)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	20.20	11.94	21.60	12.06	22.36	11.03
PAIN	23.70	14.05	24.50	16.40	21.46	12.98
SOMATIZATION	6.27	5.32	6.20	4.20	7.50	5.36
LOCUS CONTROL A	6.93	7.85	6.07	7.26	6.93	7.54
LOCUS CONTROL B	5.67	3.20	5.33	3.66	5.50	2.88

VARIABLE	60-69					
	PRE (N=1)		POST (N=1)		LATE POST (N=1)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	9.00	.	14.00	.	14.00	.
PAIN	0.00	.	7.37	.	2.95	.
SOMATIZATION	0.00	.	2.00	.	0.00	.
LOCUS CONTROL A	13.00	.	2.00	.	0.00	.
LOCUS CONTROL B	14.00	.	7.00	.	6.00	.

TABLE 14.1
INTERVENTION GROUP
LENGTH OF INJURY

VARIABLE	3-12 MONTHS					
	PRE (N=6)		POST (N=6)		LATE POST (N=6)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	36.67	9.75	35.00	5.69	27.50	10.43
PAIN	32.25	12.55	28.57	14.58	31.84	11.74
SOMATIZATION	13.50	6.35	11.83	7.83	11.67	6.68
LOCUS CONTROL A	5.00	2.76	4.00	4.52	7.17	5.42
LOCUS CONTROL B	5.83	2.93	3.83	3.19	6.33	2.16

VARIABLE	13 TO 24 MONTHS					
	PRE (N=38)		POST (N=38)		LATE POST (N=34)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	28.21	12.33	27.11	10.79	26.06	9.63
PAIN	33.16	15.23	31.80	14.11	34.22	14.45
SOMATIZATION	9.61	5.73	9.03	5.86	10.44	6.61
LOCUS CONTROL A	8.03	5.64	7.26	5.76	8.06	5.14
LOCUS CONTROL B	6.76	2.85	6.39	3.27	6.91	2.90

VARIABLE	25 TO 36 MONTHS					
	PRE (N=18)		POST (N=18)		LATE POST (N=16)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	30.89	14.15	31.78	11.23	33.25	10.99
PAIN	33.91	14.37	34.26	13.34	32.24	14.36
SOMATIZATION	10.61	5.64	12.11	8.38	12.50	9.99
LOCUS CONTROL A	6.28	4.91	6.56	5.54	6.88	5.98
LOCUS CONTROL B	6.11	3.71	7.39	3.96	6.75	3.40

TABLE 14.2
COMPARISON GROUP
LENGTH OF INJURY

VARIABLE	3 TO 12 MONTHS					
	PRE (N=7)		POST (N=7)		LATE POST (N=6)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	24.14	12.71	20.71	10.13	22.33	12.50
PAIN	17.39	10.93	19.67	12.81	20.25	13.25
SOMATIZATION	7.29	6.68	5.43	4.04	6.50	3.39
LOCUS CONTROL A	11.57	6.40	11.43	7.07	10.83	7.41
LOCUS CONTROL B	9.14	4.85	8.00	3.27	7.67	1.86

VARIABLE	13 TO 24 MONTHS					
	PRE (N=23)		POST (N=23)		LATE POST (N=20)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	15.78	9.21	16.00	10.26	16.70	9.25
PAIN	22.39	14.38	21.06	13.88	21.07	14.49
SOMATIZATION	5.48	4.11	4.78	3.42	5.95	4.49
LOCUS CONTROL A	9.39	7.49	7.00	6.76	6.70	6.49
LOCUS CONTROL B	7.87	3.72	7.57	3.57	6.45	3.05

VARIABLE	13 TO 36 MONTHS					
	PRE (N=10)		POST (N=10)		LATE POST (N=7)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	21.00	13.85	23.70	13.17	26.00	15.70
PAIN	19.88	14.47	22.48	20.39	18.78	17.72
SOMATIZATION	7.00	6.98	8.50	4.97	10.86	7.43
LOCUS CONTROL A	3.60	4.60	5.30	7.44	3.29	4.99
LOCUS CONTROL B	6.30	3.95	5.40	3.50	5.29	4.42

TABLE 15.1
INTERVENTION GROUP
EDUCATIONAL LEVEL

VARIABLE	<GRADE 12					
	PRE (N=17)		POST (N=17)		LATE POST (N=15)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	34.47	15.17	32.59	12.42	31.13	11.98
PAIN	37.24	15.97	36.91	14.08	36.93	12.01
SOMATIZATION	10.47	6.3	11.35	7.03	12.67	8.7
LOCUS CONTROL A	4.53	5.09	4.82	5.27	5.8	4.92
LOCUS CONTROL B	5.47	3.34	7.12	3.53	7.2	2.7

VARIABLE	GRADE 12					
	PRE (N=18)		POST (N=18)		LATE POST (N=17)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	29.78	10.75	27.17	11.25	26.47	9.15
PAIN	32.75	12.52	33.25	12	31.99	13.26
SOMATIZATION	11.28	5.38	9.78	7.7	10.76	6.29
LOCUS CONTROL A	6.44	4.1	6.28	5.03	6.41	4.51
LOCUS CONTROL B	7.33	2.66	5.94	3.1	6.47	2.1

VARIABLE	>GRADE 12					
	PRE (N=27)		POST (N=27)		LATE POST (N=24)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	26.89	11.86	28.48	9.2	27.75	10.33
PAIN	31.16	14.87	28.54	14.2	32.19	15.67
SOMATIZATION	9.48	5.8	9.74	6.43	10.5	7.99
LOCUS CONTROL A	9.44	5.28	8.26	5.9	9.63	5.66
LOCUS CONTROL B	6.56	3.14	6.33	3.89	6.79	3.6

TABLE 15.2
COMPARISON GROUP
EDUCATION LEVEL

VARIABLE	<GRADE 12					
	PRE (N=11)		POST (N=11)		LATE POST (N=10)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	16.91	9.94	18.64	10.38	19.20	11.47
PAIN	25.22	14.54	24.83	17.08	21.22	13.90
SOMATIZATION	5.45	4.08	5.64	4.32	5.20	2.86
LOCUS CONTROL A	8.09	7.93	6.09	6.63	6.10	6.66
LOCUS CONTROL B	7.45	5.01	6.82	4.71	5.80	3.43

VARIABLE	GRADE 12					
	PRE (N=6)		POST (N=6)		LATE POST (N=5)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	23.50	12.55	17.50	11.26	18.20	13.57
PAIN	21.31	13.13	24.52	13.75	26.94	16.13
SOMATIZATION	6.17	7.33	4.83	3.54	4.60	3.78
LOCUS CONTROL A	8.67	6.28	5.67	5.43	3.00	2.83
LOCUS CONTROL B	10.00	3.95	7.50	3.21	5.00	2.55

VARIABLE	>GRADE 12					
	PRE (N=23)		POST (N=23)		LATE POST (N=18)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	18.04	11.79	19.13	12.10	20.39	11.98
PAIN	18.70	13.49	18.55	14.71	18.20	14.73
SOMATIZATION	6.52	5.48	6.17	4.36	8.83	6.17
LOCUS CONTROL A	8.35	7.28	8.39	7.74	8.11	7.15
LOCUS CONTROL B	7.22	3.40	7.13	3.15	7.17	3.20

TABLE 16.1
INTERVENTION GROUP
LOCATION OF INJURY

VARIABLE	UPPER EXTREMITY					
	PRE (N=29)		POST (N=29)		LATE POST (N=25)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	29.59	13.83	30.79	11.83	31.80	11.35
PAIN	34.91	12.96	34.69	12.55	36.53	11.37
SOMATIZATION	11.62	5.83	12.48	7.28	14.04	8.59
LOCUS CONTROL A	6.07	4.67	6.21	5.72	5.96	5.23
LOCUS CONTROL B	6.03	3.16	6.72	3.65	6.72	2.91

VARIABLE	BACK					
	PRE (N=22)		POST (N=22)		LATE POST (N=21)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	28.00	12.00	27.95	10.75	23.24	9.42
PAIN	30.34	15.98	27.19	15.29	28.12	16.61
SOMATIZATION	8.41	5.80	7.18	5.27	7.52	4.98
LOCUS CONTROL A	7.95	5.96	6.82	5.32	9.19	5.47
LOCUS CONTROL B	6.91	2.99	6.77	3.88	7.43	3.16

VARIABLE	LOWER EXTREMITY					
	PRE (N=11)		POST (N=11)		LATE POST (N=10)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	34.00	11.20	27.64	7.92	30.00	5.25
PAIN	34.90	15.89	35.65	11.99	36.66	11.44
SOMATIZATION	10.45	4.97	10.18	6.98	11.60	7.11
LOCUS CONTROL A	8.82	5.06	8.00	6.12	8.50	4.55
LOCUS CONTROL B	6.82	3.28	5.00	2.28	5.70	2.41

TABLE 16.2
COMPARISON GROUP
LOCATION OF INJURY

VARIABLE	UPPER EXTREMITY					
	PRE (N=16)		POST (N=16)		LATE POST (N=13)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	16.69	11.23	16.13	8.88	17.85	11.40
PAIN	19.67	15.51	20.21	14.92	23.57	14.88
SOMATIZATION	5.31	5.68	4.44	3.35	5.69	4.64
LOCUS CONTROL A	9.13	7.14	7.56	6.40	6.69	6.74
LOCUS CONTROL B	8.19	3.39	7.13	3.18	5.77	2.17

VARIABLE	BACK					
	PRE (N=14)		POST (N=14)		LATE POST (N=10)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	18.79	10.65	17.64	10.29	18.90	12.65
PAIN	19.44	11.71	18.83	14.67	16.54	14.93
SOMATIZATION	5.79	4.69	5.93	3.71	7.80	5.77
LOCUS CONTROL A	8.36	7.00	8.43	7.74	7.60	7.24
LOCUS CONTROL B	7.71	4.34	7.21	3.72	8.30	3.37

VARIABLE	LOWER EXTREMITY					
	PRE (N=10)		POST (N=10)		LATE POST (N=10)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	21.20	13.01	24.50	14.63	22.90	11.69
PAIN	24.85	13.74	26.00	16.79	20.26	14.28
SOMATIZATION	8.10	5.61	7.90	5.32	8.20	5.75
LOCUS CONTROL A	7.00	7.90	5.50	7.60	5.90	6.47
LOCUS CONTROL B	6.90	4.63	6.90	4.23	5.40	3.66

TABLE 17.1
INTERVENTION GROUP
CHRONIC PAIN TREATMENT

VARIABLE	YES					
	PRE (N=29)		POST (N=29)		LATE POST (N=28)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	29.34	13.26	28.55	12.06	27.46	11.43
PAIN	31.41	13.55	33.22	13.77	33.46	14.30
SOMATIZATION	11.52	5.71	11.10	6.24	12.64	7.63
LOCUS CONTROL A	7.48	5.34	7.14	5.66	7.54	4.96
LOCUS CONTROL B	6.62	2.77	6.14	3.28	6.64	2.63

VARIABLE	NO					
	PRE (N=33)		POST (N=33)		LATE POST (N=28)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	30.21	12.47	29.82	9.69	29.07	9.47
PAIN	34.94	15.36	31.30	13.98	33.33	13.90
SOMATIZATION	9.18	5.70	9.39	7.44	9.68	7.49
LOCUS CONTROL A	7.00	5.27	6.39	5.60	7.71	5.79
LOCUS CONTROL B	6.36	3.40	6.70	3.80	6.96	3.26

TABLE 17.2
COMPARISON GROUP
CHRONIC PAIN TREATMENT

VARIABLE	YES					
	PRE (N=8)		POST (N=8)		LATE POST (N=7)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	23.87	10.89	25.63	11.81	26.00	10.02
PAIN	31.24	11.43	33.67	14.42	29.37	10.59
SOMATIZATION	5.50	3.59	6.63	4.53	7.00	3.06
LOCUS CONTROL A	7.00	6.12	6.88	6.33	7.57	8.10
LOCUS CONTROL B	4.88	3.48	5.00	2.93	5.14	3.08

VARIABLE	NO					
	PRE (N=32)		POST (N=32)		LATE POST (N=26)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	17.22	11.22	17.03	10.61	18.00	11.71
PAIN	18.30	13.09	18.05	13.89	18.03	14.69
SOMATIZATION	6.34	5.71	5.62	4.12	7.12	5.81
LOCUS CONTROL A	8.66	7.43	7.47	7.37	6.50	6.35
LOCUS CONTROL B	8.41	3.83	7.62	3.54	6.77	3.22

TABLE 18.1
INTERVENTION GROUP
WORKING AT FIRST MEASURE

VARIABLE	FULL TIME					
	PRE (N=9)		POST (N=9)		LATE POST (N=9)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	21.78	8.45	18.89	10.58	23.89	8.13
PAIN	30.63	14.46	31.93	15.83	30.68	17.11
SOMATIZATION	8.89	5.13	7.00	6.16	9.67	8.23
LOCUS CONTROL A	7.33	6.10	8.33	6.73	7.44	6.54
LOCUS CONTROL B	8.33	2.78	8.11	3.44	7.67	4.12

VARIABLE	PART TIME					
	PRE (N=5)		POST (N=5)		LATE POST (N=5)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	28.40	11.65	30.80	6.06	28.80	12.03
PAIN	33.13	14.10	31.77	23.51	36.99	18.96
SOMATIZATION	12.40	7.40	13.40	12.50	14.00	11.25
LOCUS CONTROL A	10.00	5.52	7.00	6.40	11.60	5.41
LOCUS CONTROL B	6.80	4.09	4.40	4.93	7.80	3.11

VARIABLE	NOT WORKING					
	PRE (N=48)		POST (N=48)		LATE POST (N=42)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	31.46	13.10	31.00	10.25	29.14	10.67
PAIN	33.80	14.83	32.29	12.55	33.55	12.90
SOMATIZATION	10.31	5.77	10.46	6.24	11.14	7.16
LOCUS CONTROL A	6.92	5.11	6.42	5.37	7.19	5.00
LOCUS CONTROL B	6.10	2.98	6.33	3.36	6.50	2.63

TABLE 18.2
COMPARISON GROUP
WORKING AT FIRST MEASURE

VARIABLE	FULL TIME					
	PRE (N=13)		POST (N=13)		LATE POST (N=9)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	17.23	10.38	15.38	7.22	16.00	11.68
PAIN	22.76	11.19	21.86	11.99	20.43	14.46
SOMATIZATION	7.15	5.81	7.08	3.86	7.44	5.39
LOCUS CONTROL A	11.00	6.10	10.08	6.37	9.89	5.40
LOCUS CONTROL B	9.00	3.06	8.15	3.51	8.44	2.30

VARIABLE	PART TIME					
	PRE (N=11)		POST (N=11)		LATE POST (N=9)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	18.09	11.89	18.18	10.52	20.00	11.48
PAIN	20.79	15.91	20.68	16.00	23.10	16.27
SOMATIZATION	4.36	4.63	3.27	2.33	5.00	4.39
LOCUS CONTROL A	7.82	6.16	4.64	6.14	3.89	5.84
LOCUS CONTROL B	8.36	4.54	7.82	3.31	7.00	3.32

VARIABLE	NOT WORKING					
	PRE (N=16)		POST (N=16)		LATE POST (N=15)	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
DEPRESSION	19.94	12.26	21.88	13.91	21.73	12.10
PAIN	19.43	14.57	20.95	17.71	18.84	14.36
SOMATIZATION	6.63	5.37	6.56	4.77	8.13	5.71
LOCUS CONTROL A	6.50	8.24	7.00	7.84	6.53	7.27
LOCUS CONTROL B	6.19	3.99	5.75	3.53	4.87	2.97